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ILLUSTRATED ENCYCLOPÆDIA OF GARDENING

BY WALTER P. WRIGHT

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I WILL MAKE A PRIEF OF IT IN MY NOTE-BOOK
MERRY WIVES OF WINDSOR

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An ILLUSTRATED ENCYCLOPÆDIA of GARDENING

by WALTER P. WRIGHT



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INTRODUCTION

THE Everyman's Library has placed within the reach of all classes a means of benefiting by the wisdom of every age. It has unlocked storehouses of literary treasures that hitherto were open only to the rich. Almost every sphere of human activity has been considered.

The addition of a volume on Gardening marks a decision to recognise the trend of modern taste. Gardening as a healthful and agreeable recreation, as well as a source of income, has made a notable advance in recent years. Thousands follow it as a pleasant pastime, many others as a means of livelihood. Readers find a happy association in plants and books. Poets gain inspiration from flowers. Artists learn that the making of gardens is an aid to painting beautiful pictures.

The present volume provides plant growers generally, including amateur gardeners, with a guide to the culture of popular plants and to garden practice.

Its scope embraces all the flowers, fruits, vegetables, ferns, palms, trees, and shrubs in general cultivation.

The term " popular plants " has a real meaning in my mind.

The writer of a gardening encyclopædia has always before his eyes the spectre of incompleteness. He fears to omit an obscure plant lest an irate purchaser of the volume with a taste for rarities should be aggrieved. This nervousness respecting omissions grows, and leads to the inclusion of hundreds of plants which are of no real importance.

Thousands of species are never seen outside botanical gardens or the collections of a handful of virtuosi. To include them

with the popular plants means that they rob really important things of valuable space, and prevent adequate treatment of them, except in a large and expensive volume.

The object in the present case being to produce a practical work which every one can afford, the alternatives of treating a large number of kinds inadequately or a limited number adequately present themselves. The latter has been chosen.

Special attention has been devoted to Bulbs, Flower Garden, Fruit, Greenhouse, and Kitchen Garden, under which heads a considerable amount of detailed information has been gathered together.

WALTER P. WRIGHT.

ENCYCLOPÆDIA
OF
GARDENING

Abele Tree (abē-le), the White Poplar, Populus alba.

Abelia (abē-lia, after Dr. Abel. Ord. Caprifoliaceae).—Greenhouse shrubs which are sometimes grown outside in mild districts. They are propagated by layers in spring and by cuttings under a bell glass in summer. Loam and peat, with sand, suit them. Floribunda, a spring bloomer with rosy purple flowers, is the most popular species. *See* the *Botanical Magazine*, t. 4316.

Abies, Spruce Firs (ā-bies, from *abeo*, to rise, in allusion to the tall habit. Ord. Coniferae).—Several important species are now referred to other genera by botanists, notably Albertiana, now Tsuga Mertensiana; Douglasii, now Pseudostuga Douglasii; excelsa, now Picea excelsa; Mertensiana, now Tsuga Mertensiana; Morinda, now Picea Morinda; and Smithiana, now Picea Morinda. These species still appear under Abies in the catalogues of many nurserymen. Of the most important species kept under Abies by botanists may be named balsamea, the Balm of Gilead; cephalonica, concolor (also known as lasiocarpa), grandis, nobilis, nordmanniana, pectinata (Silver Fir) and Pinsapo. These are all good Conifers, suitable for the garden, and make handsome trees in deep, fertile soil. If the natural soil is poor the young trees ought to be given a start with a barrowload of loam each. Plant in autumn or winter. The Abies are closely connected with the Piceas, but have upright instead of drooping cones, and flat, soft leaves instead of round, hard ones. They are evergreens.

Abronia (abrō-nia, from *abros*, delicate. Ord. Nyctaginae).—A small genus of perennial trailing plants, suitable for rockeries. They like sandy soil, and are commonly known as Sand Verbenas. Cuttings strike in sandy soil in spring under glass. A stock can be raised in the first place from seed, which may be sown in a frame in autumn. Arenaria, yellow, July; and fragrans, white, May, are procurable. Both are sweet. Umbellata, pink, spring, is also grown.

Abrus (ā-brus, from *abros*, delicate. Ord. Leguminosae).—The species precatorius is a stove climber, with purple flowers, and is of interest on account of the pretty scarlet and white seeds, which are used for rosaries, and also as weights. Carat, a proportional measure of $\frac{1}{24}$ of the fineness of gold, is said to derive from retti (Greek *keration*) a name applied to these seeds. They must be sown in heat.

Abutilon (abū-tilon, mallow-like, from the Arabic. Ord. Malvaceae).—Greenhouse plants, sometimes grown in pots, but often planted out, and allowed to run up rafters, walls, or pillars. They

produce large evergreen leaves, and bright, drooping, bell-shaped flowers. With the exception of Thomsonii, which is often mixed with flowering plants in the garden for the beauty of its mottled leaves; and vexillarium, which also has handsome foliage and scarlet and yellow flowers, the species have been discarded in favour of the modern varieties. Propagated by cuttings and seeds. The former (pieces of young, flowerless wood with the lower leaves removed) may be inserted, and the latter sown, in sandy soil in gentle bottom heat in spring. They thrive in sandy loam, but a third of peat may be added. Pinch out the tips, first, soon after the cuttings have rooted, and subsequently, when the resulting shoots have extended a few inches. This will make them form side shoots. If they are to be grown in pots they must have successive shifts as the pots get filled with roots, say from 3 to 6 and from 6 to 10-inch. Give a light position. They love water, both at the roots and over the foliage, throughout the summer, but not much will be required in autumn and winter. The winter temperature may be 45°. Sanderianum has beautiful foliage.

Acacia (acā-cia, from *akazo*, to sharpen. Ord. Leguminosae).—Most of these beautiful shrubs and trees have yellow, primrose, or white flowers in the form of small globes or cones, with feathery leaves; but a few have flat foliage. The well-known " mimosa " of the florists' shops is Acacia dealbata, otherwise known as the Silver Wattle. Armata, yellow; Drummondii, lemon, pretty foliage; leprosa, primrose, charming against a pillar with the flowering shoots drooping; pulchella, deep yellow, one of the smallest growers; Riceana, yellow, graceful, dependent habit; and verticillata, yellow, cone-shaped, all flower in spring, and thrive in the greenhouse. For cuttings, the tips of the shoots should be taken a few weeks after flowering, when they are fairly well matured, inserted in sandy soil, and covered with a bell glass. Acacias will do in fibrous loam, lightened with sand, but one-third of leaf mould is an advantage. The soil should be made firm at each repotting, if they are grown in pots, but they are often planted out. If straggly, prune hard after flowering, and new growth will break from the old wood, especially if they are well syringed. They must not be allowed to suffer for water in summer. Winter temperature for all the species named, 45°.

Acaena. *See* Flower Garden—Rockery.

Acalypha (a-cāl-ypha, from *akalepe*, a nettle. Ord. Euphorbiaceae).—Stove shrubs, principally grown for their handsome leaves, but hispida (sanderiana) has crimson spikes of bloom in summer. Macafeeana and musaica have marbled foliage. They may be increased by cuttings in a propagator in spring or summer, and thrive in equal parts of loam and leaf-soil, with sand.

Acanthus (acān-thus, from *akantha*, spine. Ord. Acanthaceae).—Herbaceous plants, generally represented by the species mollis (whose leaves suggested the Corinthian style of architecture), although lusitanicus (latifolius) is finer. They grow about 4 ft. high, and have white or pink flowers in summer, but are chiefly

remarkable for their handsome foliage. They may be raised from seed in a warm greenhouse or frame in spring, and should be planted out in rich soil. Subsequently they may be increased by division.

Acer, Maple (ā-cer, from *acer*, sharp. Ord. Sapindaceae).—An important genus of trees, embracing the Common, Silver, Japanese, Norway, and Scarlet Maples, as well as the Sycamore. There is also the variegated Negundo, which, although not quite hardy, survives the winter in most districts if it has partial shelter. The following species may be named: Campestre, the Common Maple, with small divided leaves; there are varieties with gold and silver margins; dasycarpum, the Silver Maple; Japonicum, several varieties; Negundo variegata, with green and white foliage, a small tree; palmatum, the Japanese Maple, many varieties; platanoides, the Norway Maple, many varieties; Pseudo-platanus, the Sycamore, many varieties; and rubrum, the Scarlet Maple, with heart-shaped leaves. The varieties of the Japanese Maple, and Negundo variegata, are well adapted for small gardens, as they give welcome colour and beauty of form in places not exposed to cold winds or hard frosts in spring. The Sycamore is perfectly hardy, and being cheap, as well as a rapid grower, is very useful, but it should not be planted too largely, as it is liable to be disfigured by blotches. Propagated by layers or seeds, the choicer varieties also by grafts and buds, but the small planter will buy young trees from nurserymen. A stiff, damp soil is not suitable for the majority, which prefer well-drained loam, but the Scarlet Maple will thrive in wet soil.

Achillea, Milfoil (achillē-a, from Achilles, who used it medicinally. Ord. Compositae).—Pretty hardy plants, mostly suitable for borders, but Clavennae, which has hoary leaves, and bears white flowers in spring; and tomentosa, which has woolly leaves and produces yellow flowers in summer, are good for the rockery also, as they only grow from 6 to 9 ins. high. Of the taller ones, Millifolium roseum, the red Milfoil, 2 ft. high, a summer bloomer; and Ptarmica, The Pearl, 2 ft. high, with double white flowers, are the best known. Propagated by division of the roots in autumn or spring, or by seeds if preferred. They are not at all particular as to soil, and will thrive in stiff, cool ground. Sericea, 1 ft., May, white, is pretty.

Achimenes (achimē-nēs, from *cheimaino*, sensitiveness to cold. Ord. Gesneraceae).—*See* Bulbs.



Section of pan with Achimenes. (*See also* Bulbs.)

Acis.—*See* Bulbs.

Aconite, Winter (Eranthis hyemalis).—*See* Bulbs.

Aconitum, Monkshood, Wolf's-bane (aconī-tum, grown near Acona. Ord. Ranunculaceae).—The common Monkshood, Aconitum Napellus, is one of the most poisonous, yet most handsome, of hardy plants. The root has been mistaken for Horseradish, and eaten, with highly unpleasant results. Some people exclude it from their gardens on account of its poisonous properties, but that

ought not to be necessary. It grows about 4 ft. high, and bears blue, helmet-shaped flowers in summer; there is a white variety. Other handsome species are Anthora, 2 ft. high, yellow; Fischeri, 4 ft., blue; Wilsoni, 4 ft., pale blue; and Lycoctonum, 4 ft., yellow. Propagation is by division in spring; in view of the poisonous nature of the roots it should be done by some responsible person, who may be trusted to avoid the dangerous practice of carelessly leaving portions of root about. A cool, substantial soil such as suits Dahlias, Sweet Peas, and Roses, will grow Monkshoods to perfection. They enjoy a shaded position.

Acroclinium (acroclīn-ium).—*See* Annuals—Half-hardy.

Adam's Needle.—*See* Yucca.

Adiantum, Maidenhair (adiān-tum, from *adiantos,* dry. Ord. Filices).—Beautiful and popular ferns, nearly all requiring greenhouse or stove treatment. There is an immense number of species, and a still larger number of varieties. The following are the principal: Capillus-Veneris, the British Maidenhair, which, although not generally hardy, grows wild in Cornwall, imbricatum is a beautiful variety of it; caudatum, stove; concinnum, good for baskets, a stove species which has a charming variety called latum; cuneatum, the popular Maidenhair, so greatly esteemed as a table plant, and for association with cut flowers, gracillimum, grandiceps, and Pacotti are pretty varieties of it, it likes a warm greenhouse; Farleyense, beautiful, broad, tinted fronds, stove; macrophyllum, a large stove species; and pedatum, hardy. Propagation is by spores and division. Sow in a propagating case, or in heat, and cover with a bell-glass. But cuneatum is easily propagated by splitting it up, and Farleyense, which does not produce spores, is exclusively increased in this way. Soil: 2 parts of loam, 1 each of peat and leaf mould, and ½ part of sand. In the main the plants must have shade, but it should not be dense; a soft, diffused light is best. When cuneatum has become rusty through being used in rooms it should be cut right down, in fact many growers make autumn pruning an annual function. It may be kept fresh in a living-room for several months if great care is taken in watering, and, while giving it air, preserving it from cold draughts. All ferns like moisture, but the soil should not be kept sodden. When fronds of Maidenhairs are to be associated with flowers, they should be cut and laid in water for a few hours before being used, then they last better.

Adonis.—*See* Flower Garden—Rockery.

Aerides (aēridēs, from *aer,* air. Ord. Orchidaceae).—Evergreen Orchids, with flowers in racemes. Fieldingii, which bears white, rose, and brown flowers in late spring, and grows about 3 ft. high, is the principal species. The Aerides require a warm, moist house. They may be planted in pans or baskets in crocks and sphagnum moss. The spring and summer temperature, when the plants are growing, may range from 75° to 85°, but in autumn and winter 10° less will suffice. Abundance of water will be required throughout the growing period, both at the roots and in the air, but the supply must be reduced in winter.

Aesculus, Chestnut (āēs-culus, having edible fruit, from the Greek. Ord. Sapindaceae).—The Chestnut, Aesculus Hippocastanum, is a well-known British tree, handsome in form and foliage, and very beautiful when in bloom. There are several varieties, including a double with pink and white flowers, and one with variegated leaves. Parviflora (small-flowered) is a handsome dwarf species which produces white flowers in spring. Propagated by seeds for the common, and by grafting for the choicer varieties, but the small planter should buy small transplanted trees in autumn, winter, or spring, and plant and stake firmly. Soil: rich, moist loam, but the tree will attain to fair dimensions in most kinds of soil.

Aethionema.—*See* Flower Garden—Rockery.

Agapanthus, African Lily (agapān-thus, from *agape*, love, and *anthos*, flower. Ord. Liliaceae).—A beautiful Cape plant with long, sword-shaped, light green leaves, and blue flowers borne in an umbel on a stout stem about 3 ft. high. It is not perfectly hardy, but is found to pass the winter in mild districts when planted out near water. More often, when used for outdoor effect, it is grown in a large tub or pot, so that it can be stood in appropriate positions, such as at the top of flights of steps, and moved indoors for the winter. It is often grown in tubs for the adornment of large conservatories. The only species is umbellatus, but there are several varieties of it. Most of them are blue, but there are also whites, and a double. Propagated by division in spring. Soil: 3 parts loam, 1 decayed manure, 1 leaf mould, and ½ sand, well mixed and made firm.

Agaricus campestris.—*See* Kitchen Garden—Mushroom.

Agathaea coelestis.—*See* Chrysanthemum—Marguerite.

Agave, Aloe (agā-ve, from *agavos*, admirable form of flower. Ord. Amaryllideae).—Handsome greenhouse plants, with fleshy, spiny leaves, and greenish-yellow, funnel-shaped flowers. They are slow growers, and bloom rarely. A tradition has grown up out of the latter fact that they flower every 100 years, but it is an error. The principal species is americana, and it is so nearly hardy that it is made use of for the garden, often being grown in large tubs and stood in prominent positions, but it will not pass the winter in cold districts. There are several varieties of it, notably picta and variegata, which have variegated leaves. Filamentosa has leaves the margins of which are furnished with long threads. Sartori is a dwarf grower and a comparatively free bloomer. Propagated by suckers, which form at the base of the plant, and may be pulled off and potted. Soil: 3 parts loam, 1 dried cow manure, 1 leaf mould, ½ part sand, pressed quite firmly. They will take a good deal of water in summer, but the supply must be reduced in autumn, and very little given in the winter.

Ageratum (agerā-tum, from *a*, without, and *geras*, old = always bright. Ord. Compositae).—Pretty dwarf plants, generally treated as annuals, being raised from seed in spring, and thrown away after seeding in autumn. If desired the fading flowers can be pinched off to prevent seed formation, and the plants preserved through the

winter in a cool house, to be subsequently increased by cuttings, which may be inserted either in autumn or spring; this plan may be adopted in order to make quite sure of keeping a variety true, but as a rule they come pretty true from seed. Where seedlings are preferred the seed may be sown in a greenhouse or heated frame in spring, and the seedlings hardened and planted out as margins to borders, or in mixed beds. Any friable, well-drained soil will do; the plants do not like a stiff, wet, adhesive soil. Mexicanum is the best-known species, and is much grown, but such varieties as Imperial Dwarf Blue and Swanley Blue are generally preferred.

Agrostemma coronaria (Rose Campion).—*See* Annuals—Hardy.

Agrostis.—*See* Grasses under Annuals.

Ailanthus (ailān-thus, from *ailanto*, tree of heaven. Ord. Simarubeae).—Ailanthus (or Ailantus) glandulosus is a handsome small tree which may be regarded as hardy, although liable to injury if exposed to cold winds. It loses its leaves in autumn. At Kew the plan is adopted of growing young plants in rich soil and cutting them back close to the ground in autumn. In the following spring the best of the shoots which start is selected, and grown on, to produce beautiful leaves in due course.

Ajuga.—*See* Flower Garden—Rockery.

Alder (Alnus glutinosa. Ord. Cupulifereae).—A well-known tree, not in great demand for parks and gardens, but esteemed because of its adaptability for damp positions. The name Alnus comes from *al*, near, and *lan*, river-bank. It will thrive in swampy places. It may be pruned annually, and made to do duty as covert. There are several distinct varieties of it, and of these aurea, with yellow foliage, is one of the best known.

Allamanda (allamān-da, after Dr. Allamand. Ord. Apocynaceae).—Beautiful stove plants, which produce large, trumpet-shaped flowers freely during summer. All the principal species—and among these Hendersoni is the best known—have yellow flowers. Their growth is so vigorous that they may be used as climbers, being trained along the rafters; or they may be trained on balloon-shaped trellises in large pots. Propagated by cuttings in spring, formed of the ends of partially matured shoots, inserted in sandy soil, and placed in a propagating case. Soil: 4 parts loam, 1 each decayed manure and leaf mould, ¼ sand. The young plants should be pinched when they have fairly started into growth. They will take a good deal of water when growing in summer, but the supply must be reduced in autumn. The plants may be pruned hard in late winter, and repotted; they will then start into growth vigorously.

Allium.—*See* Bulbs.

Allotments.—Small pieces of land, suitable for culture by working men, of special benefit in districts, whether urban or rural, where the gardens attached to the dwellings are small, or unsuitable for cropping. Flowers, fruit, and vegetables can all be grown on

allotments, and in some cases pigs and poultry may be kept on them; but in view of the fact that the plots are generally held on a yearly tenancy, it is not the rule for holders to go to much expense for buildings or fittings. Large structures, which might keep the sun from other plots, should not be permitted. Land for allotments can generally be got without serious difficulty in the country, but in case of trouble parish councils have the power of acquiring land for the purpose. It is desirable that the ground be reasonably near the cottages, and that it be fair agricultural land. The pieces should be cut up into parallel rectangular strips. Twenty square rods, poles, or perches (equal to an eighth of an acre) constitute a good average size, but it may vary according to circumstances. It is often more convenient to make smaller plots. Much larger ones are best avoided, as a man who is following a regular occupation throughout the day can hardly keep more than 20 rods clean and well cropped. Most of the county councils give instruction in allotment cultivation through their staff instructors. Deep culture and correct manuring are advised. The soil should be double-dug (*see* Kitchen Garden—Bastard trenching) and manured (*see* Manures). Except in particular circumstances, vegetables should have most of the space. The principal crops are Potatoes, Winter Greens (Broccoli, Brussels Sprouts, Kale, and Savoys), Onions, Cabbages, Beetroot, Carrots, Parsnips, Cauliflowers, Celery, Tomatoes, Peas, Beans, Turnips, Leeks, Vegetable Marrows, and Rhubarb. Artichokes, Spinach, Shallots, Cucumbers, Horseradish, Salads (Lettuces, Radishes, etc.), and Herbs (Mint, Sage, Thyme, and so forth), may also be grown if desired. It is a good plan to arrange these in some order, and crop the ground in rotations. This is not easy on very small plots, where it is necessary to give up nearly half the ground to Potatoes, but it is not altogether impossible. In the first place, the vegetables might be thrown into three groups: (1) Potatoes and Winter Greens (the latter to be planted between or after early Potatoes in summer); (2) Peas, Beans, Turnips, Celery, Leeks, Spinach, and Onions (the Turnips and Spinach going between the Peas and Beans, the Leeks and Celery following the early Peas in summer); (3) Beet, Carrot, Parsnips, and Tomatoes. The following year Sections 2 and 3, taken together, may change places with Section 1. The third year Section 2 may occupy the ground which Section 3 had the first year, and Section 3 that of Section 2, Section 1 going back to its original place. The principal crops not provided for may be arranged as follows: Cabbages for spring may be raised early in August and planted in October on ground cleared of Onions. Cauliflowers for autumn may be sown in spring and planted in summer after early Peas or Potatoes. Rhubarb, Artichokes, and Herbs may have a permanent place at one end of the plot. Vegetable Marrows and Cucumbers may be raised in pots, and planted out in summer between early Peas, to subsequently succeed them. Lettuces may be grown on Celery ridges or between Peas. The various kinds are all dealt with under Kitchen Garden in this work. It is not, as a rule, wise to plant much fruit on small allotments, and in any case the trees should not be mixed up indiscriminately with the vegetables. If planted, they should either

form a group at one end, or else be planted in straight lines at intervals of about 20 ft. across the plot. Gooseberries, Currants, Raspberries, and bush Apples on the Paradise stock would be most suitable. A bed of Strawberries may be provided if space permits. Flowers, such as annuals, may be grown in a border alongside the main path. Weeds should never be tolerated on allotments, as apart from robbing the soil they may, if they seed, prove a source of injury to other allottees than the man on whose ground they are permitted to grow. The paths should be kept neat and clean.

Allspice.—*See* Calycanthus.

Almond.—The Almond is one of the most useful of flowering trees, because it blooms so early in spring. In mild districts it may be out in March, and it is rarely later than April, except in very cold parts. The pale pink flowers cover the long branches from tip to base, so that the tree makes a very cheerful object. There are several varieties of the common Almond. Dulcis is the Sweet Almond, and Amara the Bitter Almond. Propagation need hardly be considered, because those who want trees will purchase the necessary number, probably in autumn. Soil: the Almond is not in the least particular; it will grow almost anywhere. It is a common object in the suburbs of London and other large towns.

Aloe (āl-o-e, from the Arabic *alloch*. Ord. Liliaceae).—The Aloes often excite astonishment when planted out in public parks. The flowers may be 20 or 30 ft. above the ground. They are used in sub-tropical gardens in summer, and put under cover in winter, for they are not hardy. Several of the species are suitable for cultivation in greenhouses, notably striata, with spotted leaves; succotrina, with a rosette of glaucous leaves; and variegata, the popular variegated Aloe. Propagated by suckers. Soil: equal parts of loam and peat, with a quarter of shattered brick. A temperature of about 45° will be suitable in Winter, when very little water must be given.

Alonsoa (alonsō-a, after Alonzo. Ord. Scrophularineae).—A genus of graceful plants, including several which may be treated as annuals, being sown under glass in a warm house or frame in winter, pricked off and potted singly. They are occasionally used in flower beds. Linifolia, Warscewiczii and W. compacta, all with scarlet flowers, may be treated in this way. Sandy loam suits them.

Alpine Garden and Plants.—*See* Flower Garden—Rockery.

Alströmeria.—*See* Bulbs.

Althaea, Mallow (althāē-a, from *altheo*, to cure. Ord. Malvaceae).—A useful genus, which includes the popular Hollyhock, A. rosea (*see* Hollyhocks). Another important plant is frutex (*see* Hibiscus syriacus); there are several varieties. Ficifolia is the Fig-leaved Hollyhock, and has fringed flowers. The Althaeas are handsome shrubbery plants and thrive in any good friable soil.

Alyssum (alyss-um, from *a*, without, and *lyssa*, rage = allaying anger. Ord. Cruciferae). Charming dwarf plants, with bright flowers produced in great profusion. Maritimum is a fragrant

white annual, often grown under the name of Koniga maritima. There is a variegated form which is in great favour as an edging plant. Saxatile is a yellow-flowered perennial, and its variety compactum is highly popular for spring bedding, also for rockeries; there are other varieties, including a double and a variegated. Propagated by seeds or cuttings, the perennials also by division, but maritimum and saxatile compactum are generally propagated by seeds, the former in March or April to flower the same year, the latter in May or June to flower the following year. They are not very particular as to soil, but do not care for a heavy, wet medium.

Amaranthus (amarān-thus, from *a*, not, and *maraino*, waste, alluding to the durability. Ord. Amaranthaceae).—Caudatus, the Love-lies-bleeding; and hypochondriacus, The Prince's Feather, are summer-flowering hardy annuals, and may be sown out of doors in spring. Melancholicus ruber, salicifolius, and tricolor are handsome foliage plants. The first is not infrequently used as a bedding plant where rich leaf-colour is wanted; the other two are more often grown in pots. All are raised from seed, which should be sown on a hotbed near a warm house, the seedlings pricked off when they begin to crowd each other, subsequently hardened in a cool house, and potted as needed. They will appreciate abundance of root and atmospheric moisture. Soil: loam, with a third of decayed manure and a sprinkling of sharp sand.

Amaryllis.—*See* Bulbs.

American Blight.—The Woolly Aphis, Schizoneura lanigera, attacks various trees, but principally Apples, which it often damages seriously, in part by its direct action, in part by preparing the ground for that fell scourge, canker. It fastens itself on the roots as well as on the branches, and young trees bought in should always be examined to make sure that there are none of the woolly tufts on them. The insect is really a brownish aphis, which has the power of covering its colonies with fluff. It pierces the bark and extracts the juice. Females bring forth living young in summer, and lay eggs in autumn; the former are termed viviparous. In case of a slight attack on a part of the tree easily accessible, paraffin oil or methylated spirits may be applied with a small brush, exercising care to bring the fluid to bear directly on the bodies of the insects. In the case of bad attacks on large trees this method is impracticable. The first step should be to apply water alone in a powerful spray, preferably through a hose-pipe, in order to wash away the fluff and expose the bodies of the aphides. Then a paraffin emulsion may be applied, and this can be made by boiling 1 pint of good soft soap in 1 quart of water, stirring in ½ pint of paraffin oil directly it is taken off the fire, and then churning up by means of a syringe in 6 gallons of water. Apply through a knapsack sprayer or spraying syringe. This may be put on while the trees are in leaf. If the trouble continues use the following as a winter spray—

½ lb. soft soap, 5 pints paraffin oil, 10 gallons soft water (*see* 1, 2, 3 below); 2 lb. caustic soda (*see* 4 below).

1. Dissolve the soft soap in 1 gallon of water.

2. Add the paraffin oil and beat up.
3. Pump through a spray nozzle and churn up the emulsion.
4. Dissolve the soda in 9 gallons of rain water.
5. Add the emulsion and apply.

In case of trouble from American blight on the roots, 2 oz. of bisulphide of carbon may be forced into the soil 2 ft. from the stem, avoiding the roots, in early summer, by means of a Vermorel injector.

American Cowslip.—*See* Dodecatheon.

American Cress.—*See* Kitchen Garden—Salads.

Ampelopsis, Virginian Creeper (ampelōp-sis, from *ampelos*, a vine, and *opsis*, resemblance. Ord. Ampelideae).—The common Virginian Creeper, Ampelopsis quinquefolia or hederacea, is a well-known plant, which is rightly falling into desuetude. It is rank, coarse, and lacks the beautiful colour of Veitchii, now called by botanists Vitis inconstans. The latter is a fine natural climber, giving rich tints before losing its leaves in autumn. It should always be planted in preference to the common. Propagated principally by cuttings, which may be inserted in a greenhouse in September. The plant will grow almost anywhere, and most soils suit it.

Anagallis (anagāll-is).—Pretty plants, mostly grown as greenhouse annuals. Linifolia, blue, 1 ft. high, blooms freely in the greenhouse in summer. The variety Breweri is often offered by seedsmen. These may be raised from seed in spring in the greenhouse, pricked off, and subsequently potted. Soil: 3 parts loam, 1 leaf mould, and ¼ part sand will suit them.

Anchusa (anchu-sa, from *anchousa*, a cosmetic. Ord. Boragineae).—Hardy annuals, biennials, and perennials, of which Italica, a blue-flowered perennial, blooming in summer, and the Dropmore variety, are the most popular. The latter is very rich in colour and should be preferred to the type. The Anchusas are vigorous growers, and should not be given manure. Propagated by division in autumn or spring, by root cuttings in spring, or by seeds sown in summer to give flowers the following year.

Andromeda (andrōm-eda, a classical name. Ord. Ericaceae).—The number of species in this genus has been greatly reduced by botanists, who have transferred them to other genera. This applies to the best known, floribunda, which is now called Pieris floribunda (*see* the *Botanical Magazine*, t. 1566). It grows 3 to 6 ft. high, and bears white flowers in spring. Of the rest, the most popular is polifolia, which grows about a foot high, has pink flowers in June and coloured foliage in autumn. They like a well-drained soil of sandy peat and a sheltered position. Propagated by layers in autumn, or by seeds.

Androsace (andrōs-a-ce, from *aner*, man, and *sakos*, buckler, form of anther. Ord. Primulaceae).—Charming little rockery plants, of which carnea, 3 ins. high, pink flowers in summer; lanuginosa, 9 ins., rose, summer; sarmentosa, 4 ins., pink, spring; and villosa, 4 ins., rose, spring; are four of the best. Chumbyi resembles sarmentosa. Propagated by division in spring, or by cuttings inserted in sandy soil in a frame in summer. Soil: peat, with a liberal admixture of

sand and mortar rubbish. They thrive best in positions among stones where they get plenty of root but little overhead moisture. Small squares of glass should be fixed for throwing off rain in winter.

Anemone, Wind Flower (anēm-on-e, from *anemos*, wind, growing in exposed places. Ord. Ranunculaceae).—*See* Bulbs.

Angelica (angel-ica, named from its medicinal virtues. Ord. Umbelliferae).—*See* Kitchen Garden—Herbs.

Angraecum (angrāē-cum, from *angurek*, Malay term for epiphytal Orchids. Ord. Orchidaceae).—Tropical Orchids, several of which are both beautiful and fragrant; citratum, a dwarf species with lemon-coloured flowers, is particularly sweet. Falcatum, white, very dwarf, is also perfumed. Eburneum, 1½ ft. high, white; and sesquipedale, 2 ft. high, with white flowers in winter and spring, are popular species. The latter, with its long spur, is particularly quaint and interesting. Propagated by offsets in spring. Crocks and Sphagnum moss should be used instead of soil. The small kinds are generally grown in baskets, and the larger in pots. They love a moist, warm temperature, and in large establishments are grown in the East Indian house, in which a high temperature and a saturated atmosphere are maintained. The air may be kept a little drier when the plants are flowering, but arid conditions are fatal to them when they are making their growth.

Anguloa (angulō-a, from Angulo, a Spaniard. Ord. Orchidaceae).—These handsome Orchids do well in an intermediate house, *i.e.*, one with a winter temperature of 55° to 60°. At that season they may be kept fairly dry, and a saturated atmosphere must be avoided while they are in bloom in spring, but while they are making their growth in summer they enjoy abundance of root and atmospheric moisture. They should be grown in crocks and Sphagnum moss. Soil is not required. Clowesii, 1½ ft. high, yellow, is perhaps the best-known species; but Ruckeri, 1½ ft., crimson and yellow, and uniflora, 1½ ft., cream, are also esteemed. There are several varieties of both these species. Propagated by division.

Annuals.—Annuals are plants which complete their life-cycle, from germination to seed-ripening, within a year. No experienced flower-gardener will neglect the annuals, because they will have proved their worth to him. Bought in the first place very cheaply, they will have shown that under a very simple system of culture they are capable of giving beautiful displays over a long period. Certain of the annuals, notably China Asters, Ten-week Stocks, Phlox Drummondii, Godetias, Clarkias, and Sweet Peas, are, indeed, amongst the most valuable of all garden plants, yet they can be bloomed from seed in a few weeks. They give beauty of flower, neat habit, long duration, and in some cases delicious perfume. For garden purposes it is convenient to divide the annuals into two sections, hardy and half-hardy, the former being sown out of doors where they are to bloom, the latter in a greenhouse or frame and transplanted.

Sowing hardy annuals.—Hardy annuals may be used for forming beds, or for patches in herbaceous and other borders. It is not

often, perhaps, that a whole bed is given up to a collection of hardy annuals, but there is no reason why it should not be done. With tall things like Sweet Peas and the beautiful pink Lavatera towards the centre, and dwarfer kinds like Godetias, Nasturtiums, Clarkias, Larkspurs, Love-in-a-mist, Poppies, and Mignonette near the front, a bed of annuals would be really beautiful. In such a case they should be sown in groups. The ground should be well dug, and may have a dressing of manure if poor; but it is easy to make soil too rich for annuals, and if the mould is fertile some burnt refuse and a handful of superphosphate per square yard will be preferable to dung. The surface may be left lumpy when digging, and raked down fine just before sowing. As the seed of many kinds is small, it is particularly necessary to prepare a fine tilth. Early April is a good time to sow if the weather is favourable. Thought should be given to space. It is not prudent to sow patches of different kinds of plants within a foot of each other, making no allowance for their development. Remember that even if only a small quantity of seed is sown there may be 50 plants in each patch. As a safeguard against crowding, which prevents the different kinds from being well displayed, and is bad for the individuals, every distinct kind should be sown in a ring as far from its neighbour as that plant grows high (*see* table below). The ring system of sowing is preferable to a broadcast patch because it gives a defined area for each kind, and at the same time reduces the labour of thinning. For example, if a ring a foot across is reserved for, say, a particular variety of Godetia, and the seed is sprinkled thinly in a shallow circular drill, there is likely to be much less seed used than if a square foot of ground is sown with the same kind; moreover, with fewer surplus seedlings there will be less thinning-out to do. Yet the ring of plants will be just as effective as the patch. It suffices to cover the small-seeded kinds with half an inch of soil, and the larger with an inch. In thinning, act before the plants have grown large enough to get tangled and weakly. A preliminary " run over " with finger and thumb when the seedlings are about an inch high facilitates the final " singling," as it gives a sturdy lot of plants to choose from. One sometimes sees 50 annuals crowding 6 ins. of ground; there should only be one plant on that area. Three or four plants will make a better clump in a small area than 100. Similar rings to those sown in a bed may be sown in selected positions near the front of borders.

Sowing half-hardy annuals.—A simple method of raising half-hardy annuals is to fill some shallow boxes with fine soil about mid-March, draw shallow drills from back to front 2 ins. apart, sprinkle the seed in thinly, and put a small label to each row. The boxes may be stood on a greenhouse shelf or stage, or in a frame. If they are put on a hotbed the plants must be hardened afterwards in an unheated frame. As soon as they begin to crowd in the seed boxes they must be pricked off 3 ins. apart in other boxes, kept in a light airy place, and only watered sufficiently to prevent flagging. By the time they begin to crowd again the weather will probably be mild enough for them to be planted out, or they may be potted singly.

Summer treatment outdoors.—Half-hardy annuals may be planted in beds, used as lines, set in groups in mixed borders. After they have been planted they need practically the same treatment as hardy annuals which have been thinned. One point is hoeing, which is beneficial to all classes of annuals; it keeps weeds down and aerates the soil. Staking will only be needed with a few of the latter kinds, but when plants begin to sprawl about they should be drawn together and supported (*see* remarks under Flower Garden —Herbaceous plants). If slugs and snails are troublesome, freshly slaked lime should be dusted over the plants at night. Most annuals bloom for a longer period than they would do naturally if the flowers are gathered before they have time to ripen their seeds.

GOOD HARDY ANNUALS

Name.	Colour.	Feet High
Abronia umbellata	rose	trailer
Agrostemma coronaria	crimson	1
Alyssum, Sweet	white	1
Asperula azurea setosa	blue	1¼
Bartonia aurea	yellow	1
Calendula, Prince of Orange	orange	1½
Candytuft, White Spiral	white	1
,, carmine	carmine	1
Centranthus macrosiphon	red	1
Chrysanthemum inodorum, Bridal Robe	white	¾
Chrysanthemum, Evening Star	yellow	1½
,, Morning Star	primrose	1½
,, Burridgeanum	crimson, white, and yellow	2
Clarkia elegans, double	salmon	2
,, ,, ,,	pink	2
,, ,, Firefly	orange red	2
,, marginata	rose and white	1
,, dwarf pink	pink	1
Collinsia bicolor	lilac and white	¾
,, candidissima	white	¾
Collomia coccinea	orange	¾
Convolvulus major	various	rambling
,, minor	various	1
Coreopsis coronata	yellow	1½
,, Drummondii	brown and yellow	1½
Cornflower, Victoria	blue	1
Erysimum arkansanum	yellow	1½
Eschscholtzia crocea	orange	1
,, Rose Cardinal	rose	1½
Eutoca viscida	blue	1
Gamolepis Tagetes	yellow	½
Gilia dichotoma	white	½
,, tricolor	lavender and white	1½
,, ,, alba	white	1½

Name.	Colour.	Feet High.
Glaucium luteum	yellow	2
,, phoeniceum	orange	2
Godetia, Bridesmaid	rose and white	1
,, Duchess of Albany	white	1
,, Lady Albemarle	carmine	1
,, Lady Satin Rose	rose	1
,, Schamini flore pleno	double rose	1½
Gypsophila elegans	white	1½
,, muralis	rose	¾
Helichrysum (Everlasting)	various	1
Ionopsidium acaule	violet	¼
Jacobaea (Senecio)	various	1
Kaulfussia amelloides	blue, crimson	½
Kochia tricophila (scoparia)	handsome leafage	2
Larkspur, Butterfly	blue	1
,, Dwarf Rocket	various	1
,, Stock-flowered	various	2 to 3
Lavatera rosea splendens	pink	3 to 4
,, alba splendens	white	3 to 4
Layia elegans	yellow	1
Leptosiphon hybridus	various	½
Limnanthes Douglasi	yellow and white	½
Linaria	various	¼
Linum grandiflorum rubrum	scarlet	1
Love-in-a-mist, *see* Nigella		
Love-lies-bleeding	red	2
Lupinus Hartwegi	blue and white	2
,, hybridus atrococcineus	scarlet and white	2
,, ,, albus	white	2
Malope grandiflora	red	3
Mathiola bicornis (Night-scented Stock)	lilac	1
Mignonette, Giant	white	1
,, ,,	red	1
,, Machet	red	1
Nasturtium, Tom Thumb	various	1
,, ,, ,, variegated-leaved	various	1
Nasturtium, tall	various	rambling
,, ,, variegated-leaved	various	rambling
Nemophila insignis	blue	½
,, ,, alba	white	½
Nigella, Miss Jekyll	blue	1½
Oenothera rosea	rose	½
,, Drummondii nana	yellow	1
Phacelia campanularia	blue	¾
Poppies, double	various	2
,, Shirley	various	1½
,, The Mikado	rose and white	2
,, umbrosum	scarlet, black spots	2

Name.	Colour.	Feet High.
Platystemon californicus	lemon	1
Portulaca, single	various	½
,, double	various	½
Prince's Feather	red	3
Rudbeckia, Golden Sunset	yellow	1½
Salvia, Blue Beard	blue	1
Sanvitalia procumbens	yellow	½
Saponaria calabrica	pink	½
,, ,, alba	white	½
,, Vaccaria	pink	2
Scabious, large-flowered	various	2½
Schizopetalon Walkeri	white	½
Senecio, *see* Jacobaea		
Silene armeria	rose	1½
,, pendula	pink	¾
,, ,, compacta	pink	¼
,, ,, alba	white	¼
Sphenogyne speciosa	orange	1
Statice spicata (Everlasting)	puce	1
,, Suworowi	rose	1¼
Sunflower, double	yellow	3 to 8
,, single	yellow	3 to 8
Sweet Peas, *see* special notes		
Sweet Sultan	various	1½
Venus' Looking-glass	blue	¾
Venus' Navel-wort	white	¾
Virginian Stock	red, white	¾
Viscaria cardinalis	crimson	1
,, oculata	pink, purple eye	1
Wallflower, annual	various	1
Whitlavia grandiflora	violet	1
Xeranthemum (Everlasting)	various	2

Nemophilas, Silenes, and Saponarias may be sown outdoors in September to flower in spring.

GOOD HALF-HARDY ANNUALS

Those marked ℘ are good for pots.
Those marked * are not true annuals.

Name.	Colour.	Feet High.
℘ Acroclinium (Everlasting)	rose, white	1
Ageratum	blue	1
* Antirrhinums	various	1 to 2
Arctotis grandis	white, mauve, and yellow	1
Asters, China, Comet	various	1½
℘ ,, ,, Chrysanthemum-flowered	various	1
℘ Asters, China, Dwarf Bouquet	various	¾
℘ ,, ,, Victoria	various	1½
,, ,, Quilled	various	1

Name.	Colour.	Feet High.
Asters, China, Ostrich Plume	various	2
,, ,, Paeony-flowered	various	1½
p Balsam, Camellia-flowered	various	1½
p Brachycome (Swan River Daisy)	blue	1½
p Carnation, Marguerite	various	1½
p Celosia plumosa aurea	yellow	2
p ,, ,, coccinea	red	2
Cobaea scandens	purple	rambler
Cosmea (Cosmos) bipinnata	pink, white	2½
* Dianthus (Indian Pink)	various	1
* ,, Heddewigii	various	¾
p Diascia Barberae	coral	¾
Dimorphotheca aurantiaca	orange	1
Eccremocarpus scaber	orange	rambler
Gaillardia, single	shades of orange	2
,, double	various	1½
Gilia coronopifolia	scarlet	3
Golden Feather	yellow leaves	½
p Heliotrope	lilac, mauvé	2
Helipterum (Everlasting)	yellow	1½
* Lobelia speciosa	blue	½
Maize, Japanese Striped	variegated leaves	3
,, Four-coloured	coloured foliage	3
Marigold, French	striped	1
,, African	lemon, orange	2
Martynia fragrans	purple	1½
* Mimulus tigrinus	spotted on yellow	¾
* ,, cardinalis	scarlet	1
p Nemesia strumosa Suttoni	various	1¼
* Mina lobata	cream	rambler
* Nicotiana affinis	white	2
* ,, Sanderae	shades of red	2½
* Pansy	various	½
Perilla nankinensis	dark foliage	1½
* Petunia, single	various	1
p ,, double	various	2
Phlox Drummondii	various	1
p Rhodanthe (Everlasting)	pink, white	1
Ricinus Gibsoni	dark foliage	3
p Salpiglossis	various	2
p Schizanthus	various	1 to 2
Statice sinensis	yellow and white	1½
,, sinuata hybrida	mauve, white, and yellow	1½
p Stock, Ten-week	various	1
,, Wallflower-leaved	various	1
Tagetes signata pumila	orange	¾
Venidium calendulaceum	orange	¾
* Verbena	various	1
Zinnia, single	various	1½
p ,, double	various	1½

Ornamental Grasses.—A collection of ornamental Grasses which will thrive under the treatment given to hardy annuals as described above is a good and useful feature of the flower garden. The following may be selected: Agrostis nebulosa, Avena sterilis, Briza maxima, Eragrostis elegans, Hordeum jubatum, Lagurus ovatus, Pennisetum longistylum, Stipa pennata. The sprays will be charming for vases if gathered before they mature.

Anomatheca.—*See* Bulbs.

Antennaria.—*See* Flower Garden—Rockery.

Anthemis, Camomile (ān-themis, from *anthemon,* a flower. Ord. Compositae).—Showy border plants, thriving in almost any soil, and easily propagated by division in spring. Tinctoria, the dyer's Camomile, is one of the best, and there are several varieties; they grow about 2 ft. high and bloom in July. Aizoon, May, white, is pretty. Nobilis, the common Camomile, has white flowers.

Anthericum (anthēr-icum, from *kerkos,* a hedge, and *anthos,* a flower=tall stems. Ord. Liliaceae).—Graceful plants, of which Liliago, the St. Bernard's Lily; and Liliastrum, the St. Bruno's Lily, both growing 18 ins. to 2 ft. high, and bearing white flowers in June, are the two best known. There is a large variety of each called major. Propagated by division of the root after flowering. A fertile, well-drained soil is desirable. They are hardy, and may be planted in autumn or spring.

Anthurium (anthū-rium, from *oura,* a tail, and *anthos,* a flower= the spadix. Ord. Aroideae).—Handsome stove plants, with large leaves and brilliant spathes, which may be scarlet, crimson, rose, or white. The best-known species are Andreanum, which has a scarlet spathe and a white spadix; and Scherzerianum, which is all scarlet. There are many varieties of each, varying in size and colour. Veitchii and Warocqueanum are the two principal ornamental-leaved species. Propagated by dividing the crowns in spring, each portion with roots at the base. Soil: 3 parts of peat in a fibrous, lumpy state, 1 part of leaf mould, 1 of Sphagnum moss, and 1 in equal proportions of broken crocks, charcoal, and sand. The pots must be thoroughly drained with abundance of crocks. The plants enjoy moisture, and a good deal of water should be given throughout the summer, both at the roots and in the atmosphere. This, combined with occasional repotting as needed, and a temperature with a night minimum of 65°, will insure free and healthy growth. Shade is required during hot sunshine. In winter a temperature 10° less will suffice, and less water will be needed.

Antirrhinum, Snapdragon (antirrhī-num, from *anti,* like, and *rhin,* a snout, in reference to the form of the flowers. Ord. Scrophulariaceae).—Antirrhinum majus, as represented by its beautiful modern offspring, has developed into a florist's flower, and the varieties are grown under special names, like Roses and Sweet Peas. The plant is especially esteemed in Scotland, where much good work has been done in developing the flower. Varieties of one colour only are procurable, such as crimson, rose, yellow, and white;

and these are suitable for groups and masses. But there are also beautiful forms with flaked and striped flowers. A bed of these is both bright and interesting. The type, which has pink flowers, grows about 2 ft. high. There is a dwarf strain called the Tom Thumb, which only grows about 9 ins. high. Compact strains between the two can be got, and they are perhaps the most useful of all. The value of the Snapdragons lies almost as much in their long period of blooming, and their adaptability to nearly all kinds of soil, as in their beautiful flowers. They grow continuously for several months, and almost every little side shoot forms flower buds. They will thrive in shallow, chalky soil; and they will luxuriate in cool clay. Propagated by seeds and cuttings. It is always well to raise some from seed, because, if care is taken to get it from a well-known florist, good new varieties are quite likely to appear. If sown in a greenhouse or frame in February or March, the seedlings pricked off and kept sturdy by being grown close to the glass and given plenty of air, the plants will be in flower before midsummer. Cuttings may be inserted in sandy soil in a frame in summer or autumn. It is wise to insert a few cuttings of any specially good variety that comes from seed, in order to make sure of increasing a true stock of it.

Ants.—Gardeners dislike ants among their plants because, whether they do any direct injury or not, they certainly encourage aphides. They probably do direct as well as indirect injury, particularly to fruits. The best means of reducing their numbers is to trap them with old bones, or with pieces of sponge smeared with treacle; boiling water will do the rest. Paraffin oil also disturbs them.

Aphides (green and other plant flies).—Aphides or sucking flies are familiar to all gardeners, because one species or another attacks almost every class of plant. The green fly of Roses, Solanums, Tulips, and other plants; the black fly of Asters and Broad Beans; the blue fly of Plums, are all forms of aphis. If the aphides are allowed to multiply they speedily increase to such an extent as to all but smother the plants they attack, and their rapidity of increase is such that a few individuals soon grow to as many thousands. For this reason it is wise to attack them directly they are seen, and fortunately they are easy to kill. Those who are troubled with aphides in glass structures will find that fumigating with one of the "vaporisers" which are sold in various sizes to suit large and small houses by nurserymen, seedsmen, and dealers in horticultural sundries, provides a ready and inexpensive means of keeping them down. An ounce of washing soda dissolved in a gallon of water heated up to 150° forms a simple destroyer, which may be syringed on to outdoor plants through gloved hands. A decoction of quassia, made by soaking a handful of quassia chips in a gallon of water, will also destroy aphides. Various proprietary washes are advertised for the purpose, and may be applied according to the directions supplied with them.

Aponogeton (aponogē-ton, from *apon*, water (Celtic), and *geiton*, neighbour=growing near water).—*See* Flower Garden—Water.

Apple.—*See* Fruit.

Apricot.—*See* Fruit.

Aquatic Plants.—*See* Flower Garden—Water.

Aquilegia, Columbine (aquilē-gia, from *aquila,* an eagle (alternatively from *aquilegus,* a water-collector). Ord. Ranunculaceae).—The graceful Columbine is one of the most popular of hardy herbaceous flowers, and there are few gardens in which it is not represented. The majority are best suited for borders, but a few are well adapted for the rockery. The following are a few of the principal species and hybrids: alpina, a charming blue rockery plant, 1 ft. high; caerulea, 15 to 18 ins., blue and white; caerulea hybrida, 18 to 30 ins., obtainable from seedsmen, gives a variety of colours, and the flowers have long spurs; chrysantha, 3 ft., yellow; glandulosa, blue, lilac, and white, 1 ft., an exquisite but short-lived plant that needs frequent renewal, and of which there are several pretty varieties; pyrenaica, blue and lilac, only a few inches high, suitable for the rockery; sibirica, 10 to 12 ins., blue, good for rockwork; Skinneri, 2 ft., red, green, and yellow; and Stuarti, 9 ins., blue and white, a charming hybrid. The Columbines begin to flower very early, often being in bloom in May, and they continue for a long period. They are useful for cutting. Propagated by seeds, sown in June, transplanted in August, and flowering the following year. Also by division. Soil: the strong kinds will thrive in almost any soil, from clay to chalk. The weaker ones, like glandulosa, pyrenaica, and Stuarti, should have a light, warm, well-drained loam.

Arabis, Rock Cress (ār-abis. Ord. Cruciferae).—Very cheap and easily grown plants, flowering off and on in mild spells throughout the winter, but at their best in spring, when they grow rapidly, and bloom as they extend. They are charming in the rockery, in bulb beds, at the front of mixed borders, and at the edge of basins of aquatic plants. Alpina and albida, both white-flowered and much alike, but the former a little dwarfer and more compact than the latter, are the two principal species; but the newer double white variety, flore pleno, bids fair to outdo both in public esteem. It is very graceful, having long spikes of bloom, and lasts well. Lucida variegata, which has pretty green and yellow leaves, is also a useful Arabis. Aubrietioides has large pink flowers. Alba variegata has a white-edged leaf. The single varieties are propagated by seed, sown outdoors in May or June for flowering the following season; by cuttings, or by division after flowering; the double by cuttings, which may be taken from the clumps after flowering, and struck in sandy soil in a frame, or in a shady spot out of doors. They grow well in all soils, and no special provision need be made.

Aralia (arā-lia. Ord. Araliaceae).—Handsome foliage plants, some hardy, others requiring a greenhouse or stove. The most popular species, Japonica or Sieboldii (now called Fatsia Japonica by botanists), is much esteemed as a greenhouse and room plant, being grown for its large, dark green, deeply-cut leaves. Elegantissima and Veitchii gracillima are two beautiful sorts, but they require a warm house. The same remark applies to Kerchoveana

and Reginae. Racemosa is hardy. Japonica and most of the indoor species are propagated by cuttings of ripe wood, preferably in bottom heat; Veitchii gracillima by grafting; racemosa by division. Soil: 3 parts loam, 1 leaf mould, 1 peat, ¼ part sand.

Araucaria (araucā-ria, from the Araucanos tribe. Ord. Coniferae).—A large genus of Conifers, which embraces the well-known Monkey Puzzle, imbricata, one of the few really hardy kinds, and a conspicuous object in the pleasure grounds of many places. Excelsa is the most important of the greenhouse species, and it has several varieties, such as glauca, Goldieana, and variegata. They make nice table plants. All are evergreens. Propagated by cuttings, the tops of plants being first struck, and then the shoots which start from the old stumps; they root readily in sandy loam and leaf mould in a greenhouse if kept shaded. Soil: 3 parts loam, 1 leaf mould, ¼ part sand for the pot plants. The Monkey Puzzle is not very fastidious, but does best in a deep, well-drained, loamy soil.

Arbor vitae (Thuya).—Cheap, hardy, and easily grown evergreens, often used for hedges, as well as for individual effect. When planted for forming hedges they should be inserted about 9 ins. apart. They are not quite so cheap as Privet and Thorn, but have a little more distinction. The American Arbor vitae (Thuya occidentalis) is the species most largely used for this purpose. Propagated by seeds or cuttings. Almost any soil that is deep, substantial, and well drained will suit. *See also* Thuya.

Arbour.—*See* Flower Garden—Summer-houses.

Arbutus, Strawberry Tree (arbū-tus, from *arboise* (Celtic), referring to the rough fruit. Ord. Ericaceae).—Arbutus Unedo is a handsome evergreen shrub, growing from 8 to 15 ft. high, and bearing white flowers in September, which are followed by scarlet fruits somewhat resembling Strawberries. There are pink and red-flowered varieties of it. It is hardy, generally speaking, though it may be injured in severe winters if planted in an exposed place in a cold district. Propagated by seeds sown in spring. Warm, well-drained peaty soil is desirable.



A plain galvanised wire arch.

Arches. — *See* Flower Garden — Arches.

Arctotis (arctō-tis, from *arktos*, a bear, and *ous*, an ear=shaggy fruit. Ord. Compositae). — *See* Annuals — Half-hardy.

Areca.—*See* Chrysalidocarpus.

Arenaria (arenā-ria, from *arena*, sand. Ord. Caryophyllaceae). — *See* Flower Garden—Rockery.

Aristolochia, Birthwort (aristolō-chia, from *aristos*, best, and *locheia*, parturition. Ord. Aristolochiaceae).—Singular climbers,

some evergreen, others deciduous; some hardy, others tender. One of the best known is Sipho, the "Dutchman's pipe," a hardy climber with curious brown and yellow flowers late in spring, and with handsome foliage. The most remarkable of the indoor species is gigas Sturtevantii, a stove climber with an immense greyish flower furnished with a long tail. Propagated by cuttings of young wood with a heel, preferably in a propagating case. Soil: 3 parts loam, 1 each decayed manure and leaf mould, ¼ sand, for the indoor kinds; ordinary garden soil for Sipho.

Armeria (Thrift).—*See* Flower Garden—Rockery.

Arnebia, Prophet Flower (arnē-bia, Arabic name. Ord. Boraginaceae).—Arnebias cornuta and echioides are pretty dwarf plants, suitable for the frame and borders, or for rockwork. The former, which grows 18 ins. high, and has yellow flowers in July, is an annual, and may be grown from seed sown under glass in spring. It likes a loamy, gritty, well-drained soil. Echioides grows about 9 ins. high, is a perennial, and has yellow flowers with five black dots ("marks of Mahomet," hence the name Prophet Flower) in late spring; the spots fade as the flowers age. It is propagated by cuttings or pieces of root in spring in heat. It thrives in any good soil if not dry

Arrowhead.—*See* Flower Garden—Water.

Artichoke.—*See* Kitchen Garden.

Artificial Manures.—*See* Manures.

Arum (ār-um, from *aron*, an Egyptian word. Ord. Aroideae).—The Arums are distinguished by singular flowers, resembling those of the Arum Lily in form, and in some cases by marked leaves. Italicum, which grows about 18 ins. high, and produces greenish-white flowers in April, is perhaps the best-known species. It has variegated leaves, and is hardy. Maculatum, with its poisonous scarlet autumn berries, is the native Cuckoo pint. Palaestinum or Sanctum, sometimes called the Black Calla, requires greenhouse cultivation. Cornutum is the so-called "Monarch of the East." The flowers are red, spotted with black; and the stems are spotted. It should be kept dry in winter, and needs protection from frost. Crinitum has immense red spotted flowers, and marked stems. Dracunculus has mottled stems, large leaves, and purplish flowers. Propagation is by division in spring. Any good, moist garden soil suits; nearly all are the better for litter over the roots in winter.

Arum Lily.—This plant, which is remarkable for its beautiful white spathe, is grown under various names, such as Lily of the Nile, Calla aethiopica, Richardia aethiopica, and R. Africana. The last is now the accepted botanical name. Although the plant will sometimes pass the winter out of doors unharmed it is not hardy, and is almost universally grown for flowering in winter and spring. It is particularly in demand for church decoration at Easter. There are several garden varieties of it, notably Childsiana and grandiflora, which are very large; Little Gem, a miniature form; Pearl of Stuttgart, dwarf; and The Godfrey, another miniature form. All are

white. There are also two yellow Arum Lilies, namely, Elliottiana and Pentlandii. The latter has dark green leaves with reddish petioles. Both sorts are beautiful, but much more expensive than the white. Propagation is by division or offsets in spring. Soil: 3 parts loam, 1 part decayed cow manure, ½ part sand. The Arum Lilies are often planted out in the garden in summer, and potted up about the middle of September. They will do in a minimum winter temperature of 45°, but require more heat for early winter bloom.

Arundinaria (arundinār-ia, from *arundo*, a reed. Ord. Gramineae).—A genus of Bamboos, several of which, notably Falconeri, 6 to 8 ft. high, green foliage; Hindsii, 8 to 12 ft.; Japonica, 6 to 8 ft. (also known as Bambusa Metake); auricoma, 2 to 4 ft.; humilis, 3 to 4 ft.; and nobilis, 8 to 10 ft.; are hardy. Simoni and its variegated form are very handsome, but are not quite hardy. Falcata and Veitchii require a greenhouse. Like the other two genera of Bamboos, Bambusa and Phyllostachys, the Arundinarias are the better for shelter when grown out of doors, as they are liable to be severely cut by cold winds. They do best in a moist climate. When they have flowered they die. Propagation is by division. Soil: loam, peat, and leaf mould.

Arundo, Great Reed (arūn-do, from *arundo*, a reed. Ord. Gramineae).—Arundo conspicua, with its fine, silky white panicles, which may rise to 8 ft. high in August, is no mean rival to the Pampas Grass. It looks best in a bed on grass near water. Donax is still taller, often attaining to 12 ft. Although the panicles are reddish at first, they fade off white. There is a dwarf variety of this called versicolor, which has variegated leaves. Propagation is by seeds or division in spring. Any cool, moist garden soil suits; a thin, dry soil is not good.

Ash (Fraxinus).—The Ash is one of the best known of timber trees, but is eschewed as a garden tree, owing to the greed of the roots, which run all over the place and rob the crops. Fraxinus Americana is the White Ash, F. Excelsior the Common Ash, and F. Ornus the Manna Ash. There are several varieties of each. The wood of Ash is tough and elastic; gardeners like it for the handles of their tools. Propagation is by seeds in spring for the species, by grafting for the varieties. Any soil.

Ash, Mountain (Rowan).—This is quite distinct from the ordinary Ash, and belongs to a different genus—Pyrus, species Aucuparia. It is a very handsome tree, and is in great demand for garden planting, on account of its prettily cut foliage, and still more on account of the bright orange berries which it bears in autumn. It does not, as a rule, grow to very large dimensions; a tree 25 ft. high is a good specimen. There are several varieties; one, with yellow fruit, is called fructu-luteo; others are distinguished by particularly erect or pendulous habit, or by variegated foliage. Although it loses its leaves in autumn, the Mountain Ash should not be overlooked when trees are being chosen for the garden; and it will grow in most soils.

Asparagus (culinary).—*See* Kitchen Garden.

Asparagus—ornamental (aspār-agus, from *sparasso*, to tear, in allusion to the prickles on some kinds. Ord. Liliaceae).—The ordinary Asparagus of the kitchen garden is sometimes pressed into service for ornamental purposes in its season, and other species are still more ornamental, apart from the fact that they are available at different periods. Plumosus and its variety nanus are particularly esteemed for cutting, as they are graceful and lasting. Popularly known as "Asparagus fern," they rival the Maidenhair in favour for associating with cut flowers. Sprengeri and its variety variegatus are charming basket plants; retrofractus is also good for this purpose. Verticillatus is a graceful, vigorous species suitable for growing up a pillar under glass, and bears abundance of red berries. Medeoloides is the plant popularly called Smilax, which grows freely when cut back annually, trained to perpendicular strings in a warm house, and syringed. All of those named will succeed in a warm greenhouse in a compost of loam and leaf soil (equal parts) with sand. They may be raised from seed and division of the roots.

Aspen.—This tree is a species of Populus (tremula, or trembling Poplar). The name comes from the Anglo-Saxon *aespe*. Owing to the petiole of the leaf being flattened at right angles to the plane of the leaf near the blade, a very light wind suffices to move it; consequently, the leaves are in motion when other foliage is still. It is a good tree to plant in damp places. There are several varieties of it, including a weeping form.

Asperula (aspēr-ula, from *asper*, rough. Ord. Rubiaceae).—The most useful species is azurea setosa, which is commonly grown as an annual (*see* Annuals). It has blue flowers in summer, and grows about a foot high. The white-flowered British plant called Sweet Woodruff is Asperula odorata. Hirta forms a white carpet in July.

Asphodelus, Asphodel (asphōd-elus, ās-phodel, from *a*, not, and *sphallo*, to supplant, a suggestion of surpassing beauty. Ord. Liliaceae).—One or two of the Asphodels are worth including in the herbaceous border, notably ramosus, a tall, white-flowered plant which blooms in spring, and will grow in a shady place. Acaulis is a much dwarfer plant with pink flowers. Treat like herbaceous plants. *See* Flower Garden.

Aspidistra (aspidīs-tra, from *aspidiseon*, a shield, possibly referring to the form of the flower, which is pushed up direct from the roots, and must be looked for just above the soil. Ord. Liliaceae).—The popular Parlour Palm is about the best of all plants for rooms and corridors, as it will endure draughts better than almost any other plant. Watering as needed, and an occasional sponging, keep it in good health a long time. Lurida and its form variegata may be grown. Sandy loam suits them. Propagated by division in spring, at which season they should be repotted when they need it, but that is not often.

Aspidium (aspīd-ium, from *aspidion*, a small buckler. Ord. Filices).—A genus of ferns to which botanists have now added Cyrtomium and Polystichum, together with certain minor genera; consequently, the ferns still commonly grown as Polystichum

aculeatum, P. angulare, and P. Lonchitis (respectively the Hard Shield, the Soft Shield, and the Holly ferns), are now classed as Aspidiums. There are several handsome forms of the first two, notably aculeatum proliferum and angulare grandiceps. For culture, *see* Ferns.

Asplenium, Spleenwort (asplē-nium, from *a*, not, and *splen*, spleen, in allusion to medicinal value. Ord. Filices).—A large and important genus of ferns, including kinds suitable for cool and warm greenhouses, rooms, and gardens. The Lady Fern, once called Athyrium filix-foemina, is now classed with the Spleenworts by botanists. The following are the principal species:—

Adiantum-nigrum, the Black Spleenwort, hardy; acutum is a nice form of it.

bulbiferum, a greenhouse species which produces tiny swarthy plantlets on the fronds, by which it can be propagated; Fabianum and laxum are good varieties; bulbiferum is one of the best of room ferns.

Ceterach (syn. Ceterach officinarum), the hardy Scale fern.

falcatum, a greenhouse species.

filix-foemina, the Lady Fern, hardy, of which the following are good forms: Barnesi, dissectum, and Victoriae.

flaccidum, greenhouse, good for baskets.

Nidus, the Bird's-nest fern, a graceful species requiring a warm greenhouse.

Trichomanes, the Maidenhair Spleenwort, hardy.

For culture, *see* Ferns.

Aster, China (Aster sinensis).—*See* Annuals.

Aster, Perennial, Michaelmas Daisy, Starwort (āster, from *aster*, a star, referring to the shape of the original single form. Ord. Compositae).—*See* Flower Garden—Herbaceous borders.



PROPAGATING PERENNIAL ASTER (MICHAELMAS DAISY) BY CUTTINGS.

The dotted line shows the depth to insert.

Astilbe (astīl-be, from *a*, not, and *stilbe*, brightness, flower not showy. Ord. Saxifragaceae).—This genus would be unimportant were it not that it includes the popular Spiraea japonica, of which roots are sold in large quantities by bulb dealers in autumn for spring bloom. It thrives in the bulb soil, and if given plenty of water it will throw up beautiful white plumes in abundance. It may be put into rooms when coming into bloom. Astilboides, 3 ft. high, a spring bloomer; rivularis, 4 ft., a summer bloomer, good for the waterside; and Thunbergi, 2 ft., a spring bloomer, are all good species, with white flowers, and may be grown in borders in moist places. Propagate by division in spring.

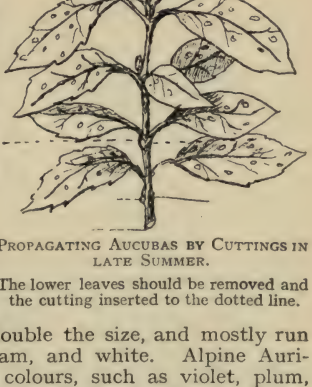
Astragalus, Milk Vetch (astrāg-alus, from the Greek. Ord. Leguminosae).—A large but not very important genus. Perhaps monspessulanus, an evergreen trailer which produces purple flowers

in early summer, is the most useful, as it can be used for the rock garden. It may be propagated by cuttings in a cold frame, sandy soil being used.

Astrantia (astrān-tia, from *astron*, star, and *anti*, comparison, alluding to the arrangement of the umbels. Ord. Umbelliferae).—Hardy herbaceous perennials, thriving in ordinary well-drained, friable soil, and propagated by division in spring. Carniolica, with white, and major, with striped, flowers are perhaps the most esteemed.

Aubrietia, Rock Cress (aubriē-tia, after M. Aubriet. Ord. Cruciferae).—Splendid dwarf hardy plants for the rock garden, and for carpeting and margining beds. They are evergreen, form dense tufts, and are in flower most of the year. Easily raised from seed in June and planted in autumn. Any soil. Dr. Mules, Leichtlinii, Campbelli (syn. Hendersoni) rosea, Fire King, Lavender, H. Marshall, Lloyd Edwards, argentea variegata, and Prichard's A 1 are good. *See also* Flower Garden—Rockery.

Aucuba (āū-cuba, from the Japanese. Ord. Cornaceae).—Useful evergreen, marbled-leaf shrubs, which will grow in almost any soil, in sun or shade, in town or country, and bear abundance of beautiful berries if both kinds are planted. The sex-flowers are on different plants. Propagated by cuttings outdoors in spring or autumn, and by seeds. *See also* Flower Garden—Shrubs.



Propagating Aucubas by Cuttings in late Summer.

The lower leaves should be removed and the cutting inserted to the dotted line.

Auricula, Bear's-ear (aurīc-ula, from the shape of the leaf. Ord. Primulaceae).—Although the show or "stage" Auricula of the florists has hard work to hold its own, the border varieties tend to grow in favour. Stage Auriculas have a band of paste round the tube, and a margin of green, grey, and white round the border colour, unless they have a yellow or dark margin, in which case they are called selfs; border varieties are double the size, and mostly run in shades of yellow, primrose, cream, and white. Alpine Auriculas have large flowers and rich colours, such as violet, plum, purple, and blue. No lover of spring flowers should fail to sow a mixed packet of Alpine and border Auriculas every spring. If the strain is good, some charming varieties are sure to appear. Any particularly good ones can be propagated and kept true by dividing them after flowering, and planting them out in a cool spot in rich soil. These Auriculas are well adapted for filling a spring bed in company with coloured Primroses, Polyanthuses, and Oxlips. They may be planted a foot apart in autumn. The show Auricula is a more delicate plant, and should have frame culture all the year

round. The good exhibition varieties increase but slowly, therefore they are never likely to be cheap plants. They are repotted in late spring, when any offsets which have formed are removed and potted separately, to be grown on into flowering plants. A compost of loam (4 parts), decayed manure, and leaf mould (1 part each), and sand is used. A suitable size of pot for the old plants is 5-in. The frame is set to face north for the summer, and is fully ventilated. In autumn it is turned to the south, and watering is reduced, very little being given in winter. The plants are looked over periodically for louse, which is brushed off and destroyed. The following are good varieties: *Green-edged*, Rev. F. D. Horner and John Garrett; *grey-edged*, Colonel Champneys and George Rudd; *white-edged*, Acme and Heather Bell. *Selfs*, Heroine and Mrs. Potts. *Alpines*, Celtic King, yellow; Masterpiece, maroon and yellow. The botanical name of the Auricula is Primula Auricula.

Azalea (azā-lea, from *azaleos*, dry, referring to the habitat. Ord. Ericaceae).—The Azalea is one of the most brilliant of early-flowering plants. It is valuable for the flower garden (*see* Shrubs under Flower Garden) and also for the greenhouse or conservatory. Its culture as a pot plant is made simple by the skill of Belgian gardeners, who specialise the plant just as Dutchmen do Hyacinths. Instead of a bulb, however, they send a plant on a clean stem a few inches long, the head of which is well set with flower-buds. There is a recognised special trade in these Belgian Azaleas. The amateur who buys them through a florist or bulb dealer is not asked an exorbitant price. He places the plants in a mildly heated house, waters them when the pots ring hollow, and sees them gradually break into a sheet of glowing bloom. These little standard Azaleas are very useful for breaking the uniformity of a flat stageful of dwarf bulbs or other plants, and they can be brought into the rooms for special occasions. A person with command of two or more houses can have a succession of bloom by forcing some of them in greater heat than the others. After flowering the blooms should be pinched off carefully to avoid injuring the growth, and the plants will grow on and make leaves. They may be stood outdoors in summer, and watered as required, when they will set a fresh lot of flower-buds. They like a peaty soil, and may be grown successfully in a compost of 3 parts peat, 1 loam, and a good sprinkling of sand. Young shoots may be removed as cuttings and struck in sandy peat under a bell-glass in bottom heat. Grafting is done in the nurseries. Good varieties of the Indian and Chinese sections for pots: Fielder's white, single; Reine des Fleurs, single salmon; Bernard André, double violet; Deutsche Perle, double early white; Souvenir de Prince Albert, double rose; and Simon Mardner, carmine rose. The following are good varieties for growing in peaty soil in the garden:—

Ghent Azaleas.

Comte de Flandre, carmine.
Madame Thibaut, cream.
Unique, yellow.

Hybrid Mollis Azaleas.

Alphonse Lavallée, orange.
Anthony Kosfer, yellow.
Duchess of Portland, cream and rose.
Glory of Boskoop, orange.

Babiana (babiā-na, from *babianer*, baboon (Dutch). Baboons eat the bulbs. Ord. Irideae).—*See* Bulbs. Ringens, scarlet; and stricta, blue and white, with the varieties of the latter, are the most popular.

Balm.—*See* Kitchen Garden—Herbs.

Balsam, Annual.—*See* Annuals—Half-hardy.

Bambusa, Bamboo (bambū-sa, from *bambos*, the Indian name. Ord. Gramineae).—There are three great genera of Bamboos: Arundinaria, Bambusa, and Phyllostachys. The Bamboos are graceful plants, and do well outdoors in sheltered places in northern climes, especially if the soil is peaty. They do not thrive if exposed to cold winds. They may be propagated by division. The following are the principal species: arundinacea, aurea, nana, palmata, pygmaea, and tessellata. Japonica and metake are both called Arundinaria Japonica by botanists now. Simoni is called Arundinaria Simoni. Viridi-glaucescens is called Phyllostachys viridi-glaucescens.

Bartonia (bartō-nia, after Dr. Barton. Ord. Loasaceae).—*See* Annuals.

Basil.—*See* Kitchen Garden—Herbs.

Bastard trenching.—*See* Kitchen Garden and Soil.

Beans.—*See* Kitchen Garden.

Bearbind (Bindweed).—*See* Calystegia.

Bed, Bedding-out.—*See* Flower Garden.

Beech.—The common Beech, Fagus sylvatica, is one of the largest and handsomest of park trees, and the Purple-leaved Beech is one of the few large trees that should be admitted to gardens. *See* Flower Garden.

Beet (Beetroot).—*See* Kitchen Garden.

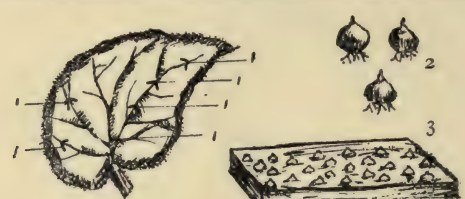
Begonia (begō-nia, after M. Begon. Ord. Begoniaceae).—This brilliant plant has made great strides in public favour, both as a summer and a winter-blooming plant. The same kinds are not used for both purposes. Varieties resulting from hybrids between tuberous-rooted species are used for summer flowering, and the offspring of fibrous-rooted species are employed for winter. We see, therefore, that there are two distinct types of Begonia, one of which produces a tuber, and another which does not. The tuberous Begonias have sprung from the South American species Boliviensis, Clarkei, Davisi, Pearcei, rosaeflora, and Veitchii. Some hybrids have now been raised between selected tuberous-rooted varieties and the fibrous-rooted species socotrana, and they are very beautiful. The following are examples:—

Winter Cheer, carmine, semi-double tuberous orange-scarlet variety and socotrana.

Julius, rose, semi-double tuberous white variety and socotrana.

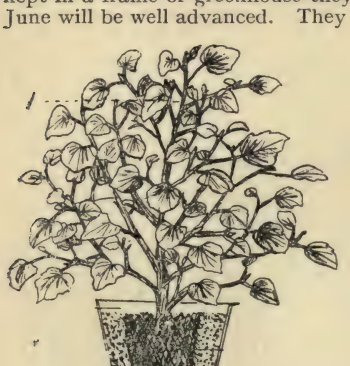
These are semi-tuberous.

The tuberous Begonias are suitable both for pot and garden cultivation, but they should not be used outdoors in shallow chalky or sandy soils unless the grower is prepared to do a good deal of watering in hot, dry summers. He should also mulch with short manure



PROPAGATING REX BEGONIAS BY LEAVES LAID ON SANDY SOIL.
1. Veins cut. 2. Tubers. 3. Tubers put in a box.

or cocoa-nut fibre refuse, to check the evaporation of moisture. When the Begonia is to be used as a bedding plant, it is wise to buy mixed tubers and embed them in leaf mould in boxes in March. If kept in a frame or greenhouse they will break into growth, and by June will be well advanced. They can then be given a good water-



PROPAGATING BEGONIA GLOIRE DE LORRAINE.
A plant which has grown again after being cut back.
1. Shoots of this kind are suitable for cuttings.



PROPAGATING BEGONIA GLOIRE DE LORRAINE BY CUTTINGS.

ing to settle the soil about their roots, and planted out a foot apart. They will probably be at their best in October, unless early frosts check them. When they are over they may be lifted, the tubers

dried and stored in fine sawdust for the winter. Named varieties may be chosen for pots if desired, but mixed tubers are cheaper. They may be potted in 5-in. pots in bulb soil (*see* Bulbs) in February or March, and brought on steadily in a greenhouse. Any good variety can be propagated by striking cuttings of the young shoots in sandy soil, or the tubers may be cut in halves the following spring. These Begonias can be flowered the same year from seed if there is heat available for it to be sown in winter. The seed is snuff-like, and a very fine surface must be prepared for it. The pan should be shaded with glass and paper until the seeds germinate. The seedlings will require careful watering (*see* Watering) and handling at the first pricking off. They will grow slowly until their tubers are formed, then much faster. The best winter-flowering Begonia is the beautiful pink Gloire de Lorraine, which has pretty foliage as well as abundance of flowers. The habit of this splendid plant is one of its chief charms, making it suitable for a hanging basket. It thrives in a temperature of 55° to 65° in winter, and when in bloom may be kept somewhat cooler. After it has bloomed it may be gradually dried off, pruned back to short stumps, and rested. With fresh watering and syringing in summer shoots will push, and these may be taken off at 3 ins. long and struck as cuttings. Another method of propagation is to take mature leaves before drying off, lightly nick the ribs, and lay them on the surface of the soil, when roots will form. Plants from leaves come somewhat more compact than those from cuttings, and bloom later. While in full growth plenty of water and a moist atmosphere are good for Gloire de Lorraine. It is beautiful under artificial light. Masterpiece is a deeper pink. Turnford Hall is a good white form, and alba grandiflora another. Other beautiful winter-flowering Begonias are Gloire de Sceaux, which has handsome brownish leaves and pink flowers; and Weltoniensis, with pink flowers. Gloire de Sceaux is a grand hybrid. It may be propagated by cuttings from the base in March, and the house should be fumigated every three weeks to keep down the mite which attacks it. It lasts in bloom many weeks. The foliage Begonias must not be overlooked, notably Rex and decora. The former is a popular window plant.

Belladonna Lily.—*See* Bulbs.

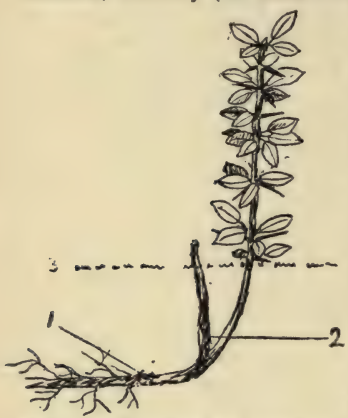
Bell-glass.—A dome-shaped glass, fitted with a knob, and made in various sizes, used for covering cuttings to exclude air till rooting has taken place.

Bellis, Daisy (bĕll-is, from *bellus*, pretty. Ord. Compositae).—The garden Daisies, varieties of Bellis perennis, are esteemed for spring flowering. They are low growers, but they produce large, bright flowers, especially in the case of such varieties as Alice, Longfellow, Rob Roy, and Snowflake. The Hen-and-chickens is a curious variety, producing small secondary flowers. The Daisies may be planted in autumn in ordinary garden soil, either as carpets for beds, or as lines; and may be propagated by division after flowering.

Berberidopsis (berberidŏp-sis, from *berberis*, and *opsis*, like, referring to the resemblance to the Berberis. Ord. Berberideae).—The

only species grown, corallina, is a handsome evergreen rambling shrub (*see* the *Botanical Magazine*, t. 5343). It bears crimson flowers at the ends of the branches in spring. It is not very particular as to soil, but likes a mild, sheltered place. It may be propagated by cuttings of young wood in spring, or by layering the branches in autumn.

Berberis, Barberry (bēr-beris, from *berberys* (Arabic). Ord. Berberideae).—Extremely valuable and beautiful shrubs, particularly the evergreen species, most of which have handsome foliage as well as pretty flowers. In Darwini, orange; and stenophylla, yellow (the latter a hybrid), the branches are clothed in flowers from base to tip in spring. The common species, vulgaris, has handsome fruit, which is sometimes preserved. Aquifolium, often grown under the older name of Mahonia aquifolia, is a useful shrub, as it grows almost anywhere, is evergreen, and bears purplish fruit. Darwini and stenophylla give of their best when sheltered from cutting winds. They may be propagated by suckers or cuttings of ripe wood in autumn.



Propagating Berberis by Suckers in Autumn.

1. Roots. 2. Young growth starting. Insert to dotted line.

Bergamot.—A name given to Monarda didyma, whose leaves, when lightly rubbed, give a bergamot-like odour. It grows 2 to 3 ft. high, has red flowers in late summer, and may be grown as an ordinary herbaceous plant.

Beta (Beet).—*See* Kitchen Garden. Beta cicla is sometimes used for the flower garden, and may be raised from seed in spring.

Betula, Birch (bēt-ula, from *betu*, the Celtic name. Ord. Cupuliferae).—The common or Silver Birch, Betula alba, is a graceful tree, worth planting in parks and on the outskirts of gardens. There are a good many forms of it, such as weeping (pendula), a cut-leaved weeping (laciniata pendula), a dark-leaved (purpurea), and a variegated-leaved (foliis-variegatis). They will grow in most soils if planted in autumn. Nice trees of the Silver Birch can be bought with long, straight stems and pyramidal heads at a low cost.

Biennials.—Biennial plants are those which complete their life-cycle in the second year from germination. Sown one year they bloom and ripen their seed the next. Several hardy biennials are of the utmost value in the flower garden, and the fragrant Wallflower stands out prominently as an indispensable plant that is best treated as a biennial. The Sweet William is another useful old

plant that thrives with treatment as a hardy biennial. If there were only these two the section would be important, but, as the table shows, there are several. The best method of treatment for the biennials is to sow the seed in well-pulverised soil in drills drawn a foot apart in May or June, thin, hoe, set out a few inches apart in a spare bed in July, and plant in beds and borders in autumn. When treated thus they are strong and sturdy, transplant well in showery weather, branch freely, and bear a long succession of flowers.

GOOD HARDY BIENNIALS

Name.	Colour.	Ft. High.
Adlumia cirrhosa	flesh	rambler
Androsace lactiflora	white	½
Aster Bigelovii	lilac	2
Campanula pyramidalis	blue	4 to 6
,, ,, alba	white	4 to 6
Canterbury Bell	blue, rose, white	2½
,, ,, Cup and Saucer	blue, white	2½
Dianthus Heddewigii	various	¾
Foxglove (Digitalis)	various	6 to 10
Gilia aggregata	scarlet	¾
Michauxia campanuloides	white	4
Poppy, Iceland	various	1
Stock, Brompton	various	1
Sweet Rocket	purple, white	2
Sweet William	various	1
Verbascum olympicum	yellow	4
Wallflower	red, yellow, brown, etc.	1½

The Dianthuses are often treated as annuals (*see* Annuals), and Eschscholtzias are almost always grown as annuals, together with Sweet Scabiouses, although both are biennials. Antirrhinums (Snapdragons) and Pentstemons are admirable when sown in boxes in autumn, wintered in a frame and planted out in spring; they bloom nearly all the following year, thus proving their worth as biennials. Wallflowers become perennial if left, but in regular garden practice it is most convenient to discard old plants after they go out of flower in late spring and raise a fresh supply from seed for the following year. Wallflowers and Snapdragons will thrive in most soils, but they are the best of all hardy flowers for poor limestone.

Bignonia (bignō-nia, after Abbé Bignon. Ord. Bignoniaceae).—Brilliant hothouse climbers, with compound leaves, well suited to train up the pillars or roof of a large heated house. They are best planted out in a compost of fibrous loam and peat in equal parts, with sand. They are propagated by cuttings of half-ripe side shoots kept close in heat; also by seed and layers. The principal species are magnifica, with purplish-crimson flowers; speciosa or picta, pink; tweediana, yellow; and venusta, orange. Capreolata,

which has scarlet flowers, may be grown outdoors in mild, sheltered places. This species may be increased by root cuttings. Bignonia radicans, which has orange flowers, and is illustrated in the *Botanical Magazine*, t. 485, is now called Tecoma radicans by botanists.

Bilberry.—This is the Vaccinium Myrtyllus of botanists, a dwarf hardy British shrub bearing pink flowers in spring. Its dark blue berries are edible. It is also called the Blaeberry or Whortleberry. The Cranberry is Vaccinium Oxycoccus.

Billbergia (billbēr-gia, after Billberg, a Swede. Ord. Bromeliaceae).—Hothouse plants, with thick, fleshy leaves crowded on a short stem, and dense heads of brilliant bloom. They thrive in equal parts of loam and peat, with a little decayed manure and a good sprinkling of sand. Propagation is by suckers. Moreli, blue and rose; thyrsoidea, scarlet; and vittata, green, red, and violet, are three of the best-known species. All bloom in autumn or winter.

Bindweed.—*See* Calystegia.

Birch.—*See* Betula.

Bird Cherry, Prunus Padus.

Birds.—Although birds do damage to various crops, they are in the main friends of the gardener, through destroying large numbers of caterpillars, grubs, and insects. Tits, swallows, robins, thrushes, starlings, wrens, flycatchers, whitethroats, cuckoos, and redstarts are mainly (in some cases wholly) insectivorous. The most damage is done to crops by blackbirds, thrushes, starlings, finches, and house sparrows. Seedlings and fruit must be protected with thread, netting, and scares. The balance of Nature should not be interfered with, and birds of prey, such as owls and hawks, should be preserved equally with song-birds.

Bird's-eye Primrose, Primula farinosa.

Bird's-nest Fern, Asplenium nidus.

Birthwort, Aristolochia.

Bitter Almond, Prunus (Amygdalus) communis amara.

Bitter-sweet, Solanum dulcamara.

Bitter Vetch, Orobus.

Blackberry (Rubus fruticosus).—*See* Fruit.

Black Fly.—*See* Aphides.

Black Thorn, Prunus spinosa.

Bladder Senna, Colutea.

Bladderwort, Utricularia.

Blanching.—*See* Kitchen Garden—Celery, Lettuce, etc.

Blandfordia (blandfōr-dia, after the Marquis of Blandford. Ord. Liliaceae).—Pretty semi-bulbous plants, suitable for the greenhouse. They are propagated by offsets and thrive in the bulb soil (*see* Bulbs). The flowers are drooping and funnel-shaped. Grandiflora (Cunninghami), with crimson flowers in summer; and flammea

aurea, yellow, summer, are two of the best. Both grow about 18 ins. high.

Blechnum (blēc-num, from *blechnon*, Greek. Ord. Filices).—A large genus of ferns, allied to Lomaria. The popular species Spicant is now called by botanists Lomaria Spicant. It is a British plant, and will therefore thrive outdoors in northern climes, but it is worth growing in pots for the cool greenhouse. For culture, *see* Ferns.

Blood, as manure.—*See* Manure.

Bloodwort or **Bloodroot,** Sanguinaria.

Bloom, Blossom.—These names are popularly applied to flowers. Bloom is also used to describe the down-like covering on the skins of Grapes and other fruit. While ".bloom " is used generally as an alternative for flowers, " blossom " is usually reserved for the inflorescence of fruit trees.

Bluebell.—The English Bluebell is Scilla nutans (*see* Bulbs) ; the Scotch is Campanula rotundifolia.

Blue-bottle (Centaurea Cyanus, the Cornflower).—The French call it Bluets. *See* Annuals—Hardy.

Bocconia, Plume Poppy (boccō-nia, after Dr. Boccone. Ord. Papaveraceae).—Bocconia cordata is a very handsome hardy herbaceous plant, and in moist, substantial soil, such as well-worked clay, attains to a height of 4 or 5 ft. The foliage is expansive, and the inflorescence is in the form of a tall spike of buff-coloured flowers. It may be propagated by division in spring. This fine plant is well worth a place in the border. It does not care for dry, shallow soil.

Bog Bean (Menyanthes trifoliata).—*See* Flower Garden—Water.

Boiler.—*See* Greenhouse—Heating.

Bolting.—A term used to indicate the running to seed of Cabbages, Celery, Lettuces, etc. It is commonly due to drought. *See* Kitchen Garden.

Boltonia (boltō-nia, after Professor Bolton. Ord. Compositae).—Boltonia asteroides is a vigorous, autumn-flowering, hardy herbaceous plant, with pale pink flowers which might easily be mistaken for a Michaelmas Daisy. It grows about 4 ft. high, and spreads freely in most soils. It is easily propagated by division in spring. It is well worth adding to any border, as its foliage is pretty. For staking, etc., *see* Flower Garden.

Bones.—*See* Manures.

Borage.—*See* Kitchen Garden—Herbs. The blue-flowered hardy annual Borage, Borago officinalis, is an aromatic plant beloved of bees. The leaves are sometimes used in salads, and for flavouring liquors. It may be raised from seed in spring, and thrives in almost any soil that is not stiff and wet.

Bordeaux Mixture.—Modern agricultural science has done no better service than in putting at our disposal certain liquids which destroy the fungoid diseases of crops. Of these the most famous is the Bordeaux Mixture, which originated in one of the great wine-

growing districts of France, and has been found useful by Potato-growers, Tomato-cultivators, and fruit-growers generally, as well as viticulturists. It consists of sulphate of copper ("bluestone"), lime, and water. The following are suitable proportions:—

For Fruit Trees.	*For Potatoes.*
8 lb. bluestone	14 lb. bluestone
8 lb. lime	9½ lb. lime
100 gallons of water	100 gallons of water

Fresh white stone lime is important, and as it cannot always be procured when wanted, it is a good plan to make a stock solution of one pound of each ingredient to a gallon of water, and keep it in a closed vessel. When wanted for use the stock solution may be diluted with water till brought to the strength advised above. In preparing the stock solution, first dissolve the pound of bluestone in half a gallon of water in a wooden vessel, then place the fresh lumps of lime in half a gallon of water, and leave both for an hour. Stir the two liquids, and pour them together through a piece of muslin to strain out any lumps. Air-slaked lime is not suitable for making Bordeaux Mixture, as it scorches the foliage of fruit trees. When applying Bordeaux Mixture, use it at the very first sign of an attack, employing a sprayer which will distribute it in a dew-like state. For Potatoes it should be applied to the under as well as the upper surface of the leaves. One application at the end of June and another at the middle of July suffice.

Border.—*See* Flower Garden—Herbaceous borders.

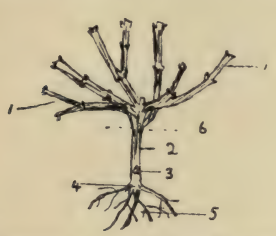
Borecole or **Kale.**—*See* Kitchen Garden.

Boronia (borō-nia, after Signor Boroni. Ord. Rutaceae).—New Holland plants with wiry shoots and hair-like roots, which need much care in watering to keep healthy. Given this they are suitable for culture in a greenhouse, and are not only pretty, but fragrant. One species, megastigma, is deliciously sweet; it has brownish flowers. Elatior, with rosy flowers, is also sweet. Heterophylla, with bright rose flowers, is the most showy but the least fragrant. Peat and loam in equal parts, with sand, suit. Propagation is by cuttings of the young shoots inserted in sandy soil under a bell-glass in August.

Bottle Brush.—*See* Callistemon.

Bougainvillea (bougainvill-ea, after M. Bougainville. Ord. Nyctagineae).—B. glabra is a handsome plant of vigorous growth, well adapted for training up the wall of a greenhouse. It blooms profusely, in fact it becomes quite covered with bracts, which are of a lilac-rose shade and of satiny texture. It is best planted out in a border of loamy soil. After flowering it should be kept dry, and in the winter the young shoots may be pruned back to the old wood, and a fresh crop will appear. Blooming in autumn, the Bougainvillea is a very useful plant. It may be propagated by cuttings in sandy soil under a bell-glass.

Bouvardia (bouvār-dia, after Dr. Bouvard. Ord. Rubiaceae).—One of the prettiest of evergreen shrubs, and may be had in bloom in winter. The plants are dwarf and bushy in habit, and may be grown successfully in 5-in. or 6-in. pots in a compost of loam (3 parts), decayed manure or leaf mould (1 part), and sand. They



A Bouvardia cut back after Flowering to yield Shoots for Cuttings.
1. Mature shoots. 2. Stem. 3. Bud. 4. Collar. 5. Roots. 6. Depth to pot.



A cut-back Bouvardia, which has produced a number of shoots suitable for cuttings.

can be grown in a frame throughout the summer, or even stood outside, and brought into a warm house in winter. Propagation may be effected by taking pieces of the root and covering them with half an inch of soil; or young shoots may be struck under a bell-glass in spring. With care in watering (*see* Watering) and a minimum temperature of 50°, the plants will give their pretty sprays of white or pink, fragrant flowers in winter. After flowering they may be partially dried off, then cut back hard, and syringed, when they



Dividing old Box.



A Shoot of Box and depth to plant.

will give plenty of young shoots suitable for cuttings. Pinch young plants to make them bushy. Good varieties: Priory Beauty, pink; Dazzler, scarlet; President Garfield, double pink; Alfred Neuner, double white.

Box, Buxus (bŭx-us, from *pyknos*, dense, in allusion to the wood. Ord. Euphorbiaceae).—The species and varieties of Box are hardy

evergreens, some of which are used for the shrubbery border, while sempervirens suffruticosa, the common Box edging, is used for bordering beds. It harbours slugs, and likewise impoverishes the soil, but its old-world appearance is in its favour, and causes people to plant it in spite of its drawbacks. It looks particularly appropriate in old Dutch gardens, with Yew hedges and trained trees. When allowed to get scraggy and gappy it is not, however, pleasing. Young rooted pieces should be planted against a straight edge of soil cut down with the spade in spring or autumn, and soil trodden against them. Clipping should be done annually in June.

Brachycome (Swan River Daisy).—*See* Annuals—Half-hardy.

Brake Fern, Pteris aquilina.

Bramble or **Blackberry** (Rubus fruticosus).—*See* Fruit.

Brassavola (brassavō-la, after Signor Brassavola. Ord. Orchidaceae).—A genus of Orchids, thriving either in pots, on blocks, or in baskets if given a warm house. Peat and Sphagnum moss should be used for compost. The plants will require a great deal of water while growing, but very little while at rest. Digbyana, green and purple, fringed lip, is the most important species. It has been crossed with Cattleyas, giving the new genus Brassocattleya, of which Baron, Cliftoni, Holfordi, and Langleyensis are good forms; and with Laelias, resulting in the genus Brassolaelia, of which some of the best representatives are Clio, Helen, and Veitchii. There is even the tri-genus Brassocattlaelia, with rare and expensive members such as Fowleri, Lawrencei, and Wigani.

Brassia (brāss-ia, after Mr. Brass. Ord. Orchidaceae).—An interesting genus of Orchids, of which the species verrucosa is the most popular. It is suitable for culture in a large, deep Orchid pan in a warm house, and produces its yellow, green, and brown flowers in spring. Being borne on arching spikes they are very graceful. Peat and Sphagnum moss make a suitable compost. When in growth and bloom regular supplies of water are necessary, but the plants need little while at rest.

Brassica (brāss-ica, from *bresic*, cabbage (Celtic). Ord. Cruciferae).—This is the generic name for Borecole, Broccoli, Brussels Sprouts, Cabbage, Cauliflower, Colewort, Kohl Rabi, Rape, Savoy, Swede, and Turnip. The Borecole, Broccoli, Brussels Sprout, Cabbage, Cauliflower, Colewort, and Savoy have all sprung from the wild Cabbage, Brassica oleracea, which grows wild on parts of the sea-shores of Great Britain. *See* Kitchen Garden.

Bravoa (bravō-a, after Señor Bravo. Ord. Amaryllideae).—A small genus of greenhouse bulbs, of which the principal species is geminiflora, which produces spikes of orange flowers in July. It may be given the general bulb treatment. *See* Bulbs.

Breastwood.—Fruit-growers generally speak of the summer shoots which spring from the front of the main branches of flat-trained trees as breastwood, but some use the term to indicate small shoots generally, and speak of front shoots as fore-right shoots. Such frontal shoots may be cut out. Only the side shoots should

be trained in, where young wood is wanted, as in Peaches. *See* Fruit.

Brier, Common, Sweet, and **Penzance.**—The common Brier, or dog Rose, Rosa canina, is used as a stock for Roses, being taken from the hedges in autumn and budded in summer (*see* Roses). The Sweetbrier, Rosa rubiginosa, is often used as an inner garden hedge, chiefly on account of the delicious odour which it diffuses after a shower. The Penzance Briers are hybrids, one of the parents of which is the Sweetbrier. They are strong growers in good soil, suitable for pillars, and bear abundance of large brilliant flowers, followed by large scarlet hips. The following are good varieties: Amy Robsart, Anne of Geierstein, Lucy Ashton, Meg Merrilies, and Rose Bradwardine. The Austrian Brier, Rosa lutea, is a pretty plant with pale yellow flowers.

Briza, Quaking Grass (brī-za, from *brizo,* to nod. Ord. Gramineae). —*See* Annuals. Maxima and minor (the latter also known as minima and gracilis) are both annuals.

Broccoli.—*See* Brassica and Kitchen Garden.

Brodiaea (brodiāē-a, after Mr. Brodie. Ord. Liliaceae).—*See* Bulbs.

Bromelia (bromē-lia, after Bromel, a Swede. Ord. Bromeliaceae). —Handsome herbaceous perennials, requiring a hothouse. Bracteata (now referred by botanists to the genus Aechmea), with pink flowers in September; and Pinguin (Binotii), red flowers in spring, are two of the best species. Loam, with a third of decayed manure and some sand, is suitable. Propagation is by suckers. The plants ought to be kept on the dry side in winter.

Broom.—A name commonly applied to certain species of Cytisus, Genista, and Spartium. The Butcher's Broom is Ruscus aculeatus; it is a good plant to grow under trees. The Brooms are very useful owing to their adaptability for light, sandy soils. The early Broom, Cytisus praecox; the Portuguese Broom, C. albus; and the Spanish Broom, Genista hispanica, are all good shrubs. Still more handsome is the beautiful brown and yellow Cytisus scoparius Andreanus. All these are worth planting in beds or shrubberies.

Brussels Sprout.—*See* Brassica and Kitchen Garden.

Buckbean (Menyanthes trifoliata).—*See* Flower Garden—Water plants.

Buckthorn, Rhamnus.

Buckthorn, Sea, Hippophae rhamnoides.

Budding.—Both fruit trees (*see* Fruit) and Roses (*see* Brier and Flower Garden) are propagated by means of budding, the buds being inserted in the stocks in summer, preferably after a shower. A proper budding-knife, such as seedsmen sell, is desirable, as with the flat tip of the handle the edges of the bark can be raised quickly and without tearing. It is most desirable that the buds should be kept moist; if they are allowed to get dry they will turn black and shrivel. If Roses are budded early they will often make strong

shoots the same year, and even bloom; but generally they do not grow till the following spring, when the stocks may be shortened to stumps, to which the young growth may be tied until they have united thoroughly.

Buddleia (buddlēī-a, after Mr. Buddle. Ord. Loganiaceae).—Beautiful shrubs, in some cases so nearly hardy as to be suitable for planting outdoors in sheltered places. B. globosa (also called capitata) bears its inflorescence in an orange ball in spring, and when well flowered is an interesting and beautiful object. B. variabilis and its variety Veitchiana bear long, Lilac-like bunches of rosy lavender flowers in July and August. All these may be planted outdoors. In rich soil they may grow 15 or 20 ft. high. They may be propagated by cuttings under a handlight in September.

Buds.—A study of buds is interesting, and it is important in the case of fruit trees, as it is necessary to know the difference between leaf buds, which are generally thin and conical, and blossom buds, which are thick and globular.

Bugle (Ajuga reptans).—A useful rockery plant. *See* Flower Garden—Rockery.

Bugloss.—*See* Anchusa.

Bulb.—A bulb is an underground bud with fleshy scales, the roots of which die annually. The Onion and the Tulip may be instanced as typical bulbs. Some plants form bulbs on the stems or at the base of the flowers. *See* Bulbs.

Bulbocodium (bulbocō-dium, from *bolbos*, a bulb, and *kodion*, wool, in allusion to the woolly covering. Ord. Liliaceae).—*See* Bulbs.

Bulbs.—Always popular on account of their usefulness both for garden and greenhouse culture, bulbs have grown in favour since their adaptability for culture in bowls has been proved. They are valuable for every class of flower lover. Those who may not feel any special predilection for the glowing Tulip or the brilliant Hyacinth may succumb to the charm of the Daffodil or the refinement of the Iris. Cheap, easily grown, flowering in spring, when gay blossoms are doubly welcome after the long, dreary months of winter, bulbs are at the command of every one. The majority of bulb lovers only know of such popular kinds as Hyacinths, Tulips, Daffodils, Crocuses, and Irises, but there are many other beautiful bulbous flowers besides these, and a list of them shall be given. First, however, a few words about the principal kinds and the best methods of culture.

Bulbs for the garden.—Bulbs are extremely useful for garden decoration, because they can be planted when the summer flowers are over. Thus, when the ground is cleared of the various summer bedders (*see* Flower Garden—Bedding-out) another set of plants is ready to go in. It is true that when the bulbs are planted and covered the ground is left bare for several weeks, but soil is not an eyesore if it is cultivated. Moreover, those who strongly object to bare ground may plant the bulbs in widely separated groups and plant clumps of Wallflowers among them; or they may plant dwarf

things like Arabis, Aubrietia, and Forget-me-not at the same time that the bulbs are put in. The beds should be well dug when the summer plants are cleared away, and the soil crumbled with the fork. Before finishing, the soil should be thrown well up from the grass verges, and these neatly trimmed with the shears. Separate groups of bulbs look better than concentric lines. The number per clump may vary from 3 to 12. The bulbs composing each clump may stand 9 ins. from each other, and there should be a clear space of a foot between the various groups. It is a good plan to sprinkle some sand in the holes. A light dressing of decayed manure, supplemented with basic slag at the rate of half a pound per square yard, will suffice for enriching the soil. Crocuses may be covered with an inch of soil; Hyacinths, Tulips, and the small-bulbed Narcissi with 2 ins.; large Daffodils with 3 ins. It should be remembered in grouping that the large Narcissi are somewhat taller than the Hyacinths and early Tulips, but that most of the May-blooming Tulips are not only later in flowering than any of the preceding, but are also taller. The order of blooming is: (1) Crocuses; (2) Hyacinths; (3) Dutch Tulips; (4) May Tulips. There is not much difference between (2) and (3). The drawback to planting bulbs in borders (*see* Flower Garden — Herbaceous borders) is that the plants are out of sight for the greater part of the year, and careless workmen plant other things over them in autumn, or injure them in digging. The remedies are: (1) labels, which must be renewed now and then; (2) careful digging. When bulbs are unearthed in autumn it is found that they are rooting freely and have commenced top growth; when replanted at once they sustain no injury.

Bulbs in grass.—It is common to plant bulbs in turf nowadays. Daffodils are particularly suitable, and Crocuses and Snowdrops are also good. Hyacinths and Tulips should be kept for open soil. The bulbs may be planted in autumn, either by taking up pieces of turf here and there, stirring the soil, adding a little sand and basic slag, and replacing the turf; or by using a special bulb-planter, an implement which obviates lifting the turf. All the Narcissi look nice in grass, and the Poet's must not be forgotten for late blooming. It is not advisable to plant in tennis lawns, or in grass close to the house, as cutting has to be deferred, for the sake of the bulbs, till the middle or end of June; and by that time the grass has grown long and tangled. Bulbs may be planted freely in the woodland and wild garden.

Bulbs in pots. — Every greenhouse-owner learns the value of bulbs in winter and spring. They give him charming material for his stages. Despite a little stiffness, Hyacinths are pre-eminent; but Tulips and Daffodils are beautiful too. All love a gritty, loamy soil; and a splendid compost is 3 parts loam, 1 part leaf mould, and $\frac{1}{8}$ part sand, all well mixed and used in a moist but not sodden state. The best sizes of flower-pot are 5-in. and 6-in., the former for 1 Hyacinth or Polyanthus Narcissus, the latter for 3 Tulips or Daffodils. The potting may be done in October, and the soil should be pressed firmly, though not quite hard, round the bulbs, the tips of which may be left protruding.

By standing the pots on a bed of cinders and covering with a few inches of cocoa-nut fibre refuse, the bulbs can be safely disposed of for 6 or 8 weeks. They will not want watering. The fibre will check top-growth till root action has developed, which is desirable. The tips should not extend more than an inch in the fibre, however. When brought out the plants can be kept quite cool, or subjected to gentle heat, according as late or early bloom is wanted. Strong heat is not desirable. With water, staking, liquid manure twice a week when buds show, and a light, airy place, the plants will be successful. Tulips and Daffodils may be planted out after they have gone out of bloom if desired, but Hyacinths are not worth keeping.

Bulbs in bowls of fibre.—This modern method of growing bulbs has much to recommend it, especially from the point of view of the room-gardener. It is clean, interesting, light, and gives results equal to those from pots. Wide-mouthed, dark green China bowls, costing threepence to a shilling each, according to size, are suitable. Peat-moss fibre, mixed with fine shell and a little charcoal, is the material used. It should be thoroughly moistened while it is being turned about in the mixing process. Tulips and Daffodils, used in threes in 6-in.-wide bowls, look well. Hyacinths and Liliums may be used also. The tips of the bulbs may protrude slightly from the fibre, which should be made firm. As soon as the bowls are filled they should be stood in a dark, cool place. A dry cupboard near a fire is not good; a cellar is better. The fibre must never be allowed to remain quite dry for long. In 6 or 8 weeks the bowls may be brought into the light. Stakes will be needed for the Hyacinths and the larger Daffodils.

Bulbs in water.—Water culture is not practised much now that fibre has proved so good, but Hyacinths may be grown in glasses if desired. The cottage widow loves to have a few glasses on her window-ledge, and her better-placed sisters also find great interest and pleasure in this system of culture. All bulb dealers and most crockery makers supply suitable glasses, which only need filling with clean water containing 2 or 3 pieces of charcoal to be ready for the bulbs. Even, firm-based bulbs should be chosen, and set in just above the water. A few weeks in the dark will set the roots moving freely, and then the plants can have light. Wire supports will be needed when the plants bloom.

Bulbs in boxes for transplanting.—When dealing with bulbs in autumn it is a good plan to fill one or two shallow boxes with Tulips and Daffodils, as it often happens that places can be found for bowls of bulbs in spring which are not vacant in autumn. The plants can be shifted successfully from the boxes when they are in bud, and if moss is packed round and over them they look fresh, neat, natural, and pretty when they come into bloom.

Bulbs in bowls of water.—Bulbs may also be grown in bowls partially filled with bright, clean pebbles and then filled up with water. Polyanthus Narcissi look very nice done in this way. The "Joss Lily," so popular a few years ago, belongs to this class.

Bulbs in window-boxes.—All the popular kinds come in very useful for window-boxes when the summer occupants are cleared away.

The hints on height, season of bloom, and distance already given will guide in planting.

Selections of bulbs.—The following are selections of the most important kinds of bulbs:—

Achimenes.—A genus of Gesneraceous plants, forming tubercles at the root, to which the plants die back in autumn, and from which they start again the following spring. They are particularly suitable for hanging baskets, and will thrive in bulb soil that is kept in the basket by a lining of moss. The tubercles may be started into growth in pans or boxes in a warm house or frame in winter, and potted or put 3 ins. apart round the baskets when they are 3 ins. high. The plants like a moist atmosphere and plenty of water while in growth. When in full bloom they may be hung in a cool house. Among many good varieties, Admiration, violet-magenta; Ambroise Verschaffelt, white, netted yellow; Dazzle, vermilion; and Rose Queen, rose, may be named. (*See also* page 3.)

Acis.—Closely allied to the Snowflakes (*see* Leucojum). The principal species is autumnale, white, tinged rose, growing about 6 ins. high and blooming in summer. It does best in sandy peat on the rockery.

Aconite, Winter (Eranthis hyemalis).—A pretty, low, winter-blooming plant with a green frill round the pale yellow flowers. Plant 6 ins. apart and an inch deep.

Allium.—The white Neapolitanum is the best known; Moly, yellow; Ostrowskyanum, rose; and triquetrum, white, drooping, are also good.

Alstroemerias.—These grow about a yard high and make thick clumps, bearing flowers streaked and spotted with orange, red, and yellow. Aurantiaca, Chilensis, and Pelegrina are good species. There is a white variety of the last. Plant a foot apart.

Amaryllis.—The beautiful large-flowered hybrids which bloom in advance of their leaves in warm houses in winter are now called Hippeastrums. They are handsome pot plants, having flowers 6 to 9 ins. across, of handsome form and brilliantly coloured. The bulbs go to rest in summer, and may be re-started in batches in autumn and winter in order to get a succession of bloom. Grow in 5-in. and 6-in. pots. Amaryllis Belladonna is lovely in a sheltered place out of doors in September. The plants may be lifted and potted when they show bud. The leaves come after the flowers. This beautiful plant is called the Belladonna Lily. There are several forms, differing in tint and size. Amaryllis formosissima is the Jacobean Lily, a plant which produces bright crimson flowers in May and is well adapted for the unheated greenhouse. Amaryllis purpurea, otherwise Vallota purpurea, is the brilliant scarlet Scarborough Lily, a fine plant for a cool greenhouse or room window. Very little water is needed in winter and spring, but a good deal in summer. Amaryllis (more often Sternbergia) lutea is a beautiful little Crocus-like bulb with bright yellow flowers in early autumn, borne in advance of the leaves, suitable for the garden; it should be planted in late summer. Amaryllis (more correctly Nerine) sarniensis is the lovely Guernsey Lily, which requires the same treatment as the Belladonna. We see that the Amaryllises are

good for both greenhouse and garden, but they are chiefly valuable as yielding beautiful flowers in the greenhouse.

Anemones (Windflowers).—These, together with Crocuses, Cyclamens, Gladioli, many Irises, Ranunculuses, and Winter Aconites are not bulbs, botanically speaking, but are generally classed with them. Anemones are among the most brilliant and useful of garden plants, and one kind or other can be had in bloom all the year round by using cool frames part of the year. The fulgens class is very beautiful. Annulata, single scarlet; King of Scarlets, double scarlet; Rose de Nice, double pink; and Snowball, double white, are gems in this section. The tubers may be planted in late summer, autumn, and winter. The St. Brigid and Alderborough are large strains of Poppy Anemone, which bear single, semi-double, and double flowers of the most brilliant and varied colours. Seeds may be sown in spring, or roots planted 9 ins. apart in spring or autumn. The Japanese Anemone, A. japonica, is a grand late summer plant, with large flowers on long stems. This may be grown in the herbaceous border. Honorine Jobert, white; Lady Ardilaun, white; Queen Charlotte, pink, semi-double; Silver Vase, double white; and Whirlwind, double white, are popular varieties. Of the smaller species of Anemone, Apennina, blue; blanda, deep blue, a dwarf winter bloomer; nemorosa Robinsoniana, a blue form of the Wood Anemone; and Pulsatilla, silky purple, are perhaps the best. These are all good for the rockery.

Anomatheca.—The most popular species is cruenta, a pretty plant growing 6 to 9 ins. high, and bearing crimson flowers in summer. It should have a warm spot on the rockery, and be grown in a frame.

Babianas are pretty Cape bulbs suitable for culture like Ixias (*see* page 48).

Brodiaea.—This is a very charming genus, and a great favourite with bulb lovers, although not known to the majority of amateurs. The plants are good for rockeries and cool greenhouses. Coccinea, with drooping crimson flowers; grandiflora, violet; ixioides splendens, yellow; and laxa, purple, are all good.

Bulbocodium.—There is only one important plant in this small genus, and it is the pretty little purple-flowered, Crocus-like B. vernum, which flowers in winter or early spring. It likes a sandy, loamy soil, and a sunny spot on the rockery or at the front of the border. Propagation is by offsets. There is a variety of it called versicolor.

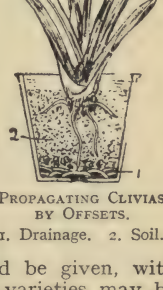
Calochortus (Mariposa Lily).—A lovely genus, with flowers as large as Tulips and beautifully marked. They thrive in light, gritty soil in sheltered, sunny places, and may be grown in pots. They should be planted 9 ins. apart and 3 ins. deep in autumn. Albus, white; luteus, yellow; pulchellus, yellow; splendens, lilac; and venustus, white, are the best species.

Camassia esculenta.—Useful for the herbaceous border in May, bearing handsome spikes of blue, starry flowers. Plant 2 ins. deep and 9 ins. apart in autumn.

Chionodoxa (Glory of the Snow).—An exquisite little blue and white bulb, flowering in winter with the Snowdrops. It is good for the rockery, or for planting in colonies at the front of the border.

Insert an inch deep and 3 ins. apart in autumn. Sardensis is a Gentian blue, quite distinct from the typical Luciliae.

Christmas Rose (Helleborus niger).—Not a true bulbous plant, but none the less one of the most beautiful of those handled by bulb dealers. The best time to plant it is September, and those who know their business take care to order it with their earliest bulbs, and to plant a foot apart before the summer has gone. It thrives in most soils, and enjoys shade. Madame Fourcade is a fine variety, and so is maximus; both have white flowers. If the clumps can be covered with handlights there ought to be no doubt of a supply of stainless flowers at Christmas. The Lenten Rose (Helleborus orientalis) may be considered with the Christmas Rose, to which it forms a succession. The foliage is brighter in colour, and the flowers are larger and more varied. There are many varieties.



Propagating Clivias by Offsets.
1. Drainage. 2. Soil.

Clivia (Imantophyllum).—A great favourite for greenhouse and room decoration. House gardeners esteem the Clivia highly, not only because it has handsome habit and bright flowers, but because it is not affected by artificial illuminants. The plants thrive in the stock bulb compost, and bloom best when they become pot-bound, so that they should not be repotted frequently. When they are growing freely large quantities of water should be given, with liquid manure twice a week. Miniata and its varieties may be chosen. Propagation is by offsets.

Colchicum (Meadow Saffron).—Pretty autumn-flowering bulbs. Autumnale is the best known, but speciosum is a finer plant. They thrive in cool places and make pretty clumps.

Crocus.—One of our most popular cheap early bulbs, good for beds, borders, margins, and grass, but not effective in pots. The golden yellow is the best, but must be protected from birds by stringing black threads above it, otherwise the effect may be spoiled. King of the Blues and King of the Whites are two fine varieties; Purpurea grandiflora is a good dark. Set 6 ins. apart when lines are being formed. Many of the species are worth planting on the rockery, notably vernus, Sieberi, iridiflorus, and zonatus.

Crown Imperial (Fritillaria imperialis).—A very handsome plant, allied with the common Fritillary, but of totally different habit, growing 2 to 3 ft. high, and bearing a cluster of large, drooping flowers. A red and a yellow may be got, also a duplex variety called Crown-upon-Crown. These are splendid plants for the border, and should be set 18 ins. apart.

Cyclamen.—The hardy Cyclamens are much smaller than the varieties of persicum which we see grown in pots for greenhouse decoration, but they are just as beautiful in their way; in fact, it would be difficult to find anything in the way of hardy flowers more charming than a colony of coum, europaeum, or Neapolitanum established in a shady spot. To get the best result a

dozen or more corms should be set 6 ins. apart and 3 ins. deep in a clump. They like peaty soil, or loam thoroughly impregnated with leaf mould; lime rubbish is also good for these dainty little plants. The greenhouse varieties are very beautiful, and may be raised from seed in late summer, put singly into small pots when they have made 3 or 4 leaves, and transferred to 5-in. or 6-in. the following summer. During hot summer weather they should be kept in a frame or cool, shady house. The air should be kept humid by syringing frequently. Any flowers which show should be picked out until mid-autumn, when the plants will come gradually into flower and remain in beauty in a warm greenhouse for several weeks. Most growers raise fresh stock every year, and discard the old plants after blooming, thus treating them as biennials; but others keep the old plants after flowering. Cyclamens grow slowly in the seedling stage, because they have to form the corm.



How to plant Daffodils.

1. Base of large bulb 5 ins. from the surface.
2. Top of large bulb 2½ ins. from the surface.
3. Smaller bulb with top 1½ in. from the surface.



Narcissus Bulbocodium.

Daffodil (Narcissus). — The most popular of all bulbs, and, as we have seen, good alike for beds, borders, rockeries, grass, woodland, pots, and bowls. The following are good varieties:—

Early Trumpet Daffodils.

*Golden Spur
*Henry Irving
*Obvallaris

Later Trumpet Varieties.

Cernuus
*Emperor
*Empress
Glory of Leyden
*Horsefieldi
King Alfred
Madame de Graaff
Mrs. Walter T. Ware
Van Waveren's Giant
Victoria

Chalice Narcissi.

Blackwell
C. J. Backhouse
*Cynosure
Frank Miles
Gloria Mundi
Homespun
Lady M. Boscawen
*Stella superba
*Sir Watkin

Poeticus Varieties.

Almira
Ben Jonson

*Ornatus (early)
*Pheasant's Eye
*Plenus (double)

Various Sections.

*Barri conspicuus, Barri section
Firebrand, Burb dgei section
John Bain, Lee lsii section
Seagull ,, ,,
Duchess of Westminster, Leedsii section
Elvira, Poetaz section

For Rockeries.

*Johnstoni, Queen of Spain
Minimus
Triandrus

Double Daffodils.

Cernuus plenus
*Double incomparabilis (Butter and Eggs)
*Orange Phoenix (Eggs and Bacon)
*Poeticus plenus
*Sulphur Phoenix
*Telamonius plenus

Polyanthus Narcissi.

Bathurst
*Double Roman
*Grand Monarque
*Paper White
White Pearl

Jonquils.

*Campernelle
*Double
Odorus rugulosus
*Single Sweet

A few choice varieties are here intermingled with the popular, inexpensive sorts. The latter are marked *.

Dicentra (Dielytra).—The popular species spectabilis is the well-known Bleeding Heart, which has drooping, lyre-shaped, coral-pink flowers on long pendulous stems. It succeeds in sheltered places out of doors if roots are planted in autumn. It is much used for greenhouse work, and answers well if potted in bulb soil in Autumn, kept cool through the winter, and given a warm greenhouse, light, air, and abundance of water in spring. Eximia and formosa are two good species of Dicentra which may be grown in herbaceous borders.

Erythronium (Dog's Tooth Violet).—Charming bulbs, with quaint flowers, well adapted for cool, shady spots in the rock garden, where they will flower in spring. The common Dog's Tooth Violet varies in colour; there are rose and white forms of it. Americanum, yellow spotted with brown; and giganteum, cream with orange patches, are good species. They may all be planted about 6 ins. deep and 9 ins. apart in autumn.

Freesia.—One of the most fragrant of bulbs and a real gem for blooming in winter and spring. By putting several bulbs an inch apart in 5-in. pots in bulb soil in autumn, placing them in a frame (not plunged in fibre), and bringing them into heat in batches, it is easy to get a long succession of bloom. The plants are nearly hardy, and may be used for an unheated greenhouse. They like a light, airy position, and plenty of water once the buds have formed. After flowering they should be dried off by degrees, and finally spread on a shelf in the sun to ripen. Refracta alba, white with yellow markings, is the original kind. Leichtlini major has primrose flowers, and is a very strong grower. Hybrids are being developed, and should be looked out for by bulb lovers; Chapmanii, yellow, is one.

Fritillaria (Snake's Head Lily).—The chequered lilac flowers of Fritillaria Meleagris have a subdued and composed appearance. There is nothing brilliant and assertive about them, but they are

quaint and pleasing. They droop on their stems at a height of about a foot from the ground. The Snake's Head looks very well in grass, and it may be grown on the rockery, or near the front of the border. Well-drained sandy soil should be provided, and the bulbs may be put 4 ins. deep in autumn. White and pink varieties of Meleagris are procurable, and there is a yellow species named aurea.

Funkia (Plantain Lily).—The bulb dealer handles this pretty, broad-leaved, Lily-like plant, which thrives in shady places, and looks well near the front of the herbaceous border. The variegated-leaved varieties look well in pots in conservatories and rooms. They may be put in the bulb compost in autumn. Fortunei and subcordata grandiflora are two of the best plain-leaved forms for the garden. Undulata variegata is a pretty striped sort.

Gladiolus.—The most beautiful of all the pseudo-bulbous plants, and one to which special attention should be devoted. Combining, as it does, beautiful form, graceful habit, and brilliant colours with a period of blooming which brings it between the summer and autumn flowers, it is almost indispensable. Gladioli are not difficult plants to grow if the soil is well drained and free from wire-worm, but they do not like stiff, damp soil, and on newly broken pasture-land they suffer severely from ground pests. Well-drained loamy soil suits them best. It should be broken up deeply and a coat of decayed manure put under the top-spit. If this is done in winter, the surface may be left rough and dressed with soot or wood ashes to which superphosphate or bone flour at the rate of ¼ lb. per square yard has been added. This should be dug well in. The corms may be planted a foot apart and 3 ins. deep in April. The plants will need staking before they come into bloom. The smaller, early-blooming varieties, like Blushing Bride (delicatissima), cardinalis, and Colvillei alba, are good for pots, and may be put in the bulb compost in autumn and treated like other bulbs. The flower gardener who does not care to specialise Gladioli under names may buy mixed hybrids of Gandavensis, Childsii, and Lemoinei. He should also get the fine scarlet Brenchleyensis, which is brilliant in colour, lasts long in beauty, and is cheap. If, however, he wants a collection of named varieties he might procure the following:—



Increasing Gladioli.

1. New corm. 3. Spawn. 4. Small corms. 5. Old decayed corm.

Angèle, tinted white
Armagnac, crimson
Black Prince, violet
Canicule, scarlet, lemon throat
Hallé, blush
Hercules, scarlet

Marie Thérèse, white, lemon throat
Pearl, white
Pius X., pink, white, and lemon
Safrano, yellow
Sanspareil, salmon-pink, white throat
Van Dael, pink

These are all of the finest quality. It is well to take the corms up, with their labels, in early winter, and store them in a dry, frost-proof place till spring. Gladiolus lovers should look out for the hybrids of primulinus and Gandavensis, a modern race, the inner segment of whose flowers droops over so as to make them look like the Orchid Anguloa. The colours are shades of yellow.

Guernsey Lily.—*See* Amaryllis and Nerine.

Helleborus.—*See* Christmas and Lenten Roses.

Hemerocallis (Day Lily).—This short-lived flower makes up for its fugacity by blooming abundantly, and the plant is a graceful one, well adapted for sunny positions in the herbaceous border. If planted a foot apart in clumps in autumn it makes an effective display in early summer, and goes on flowering a long time. Aurantiaca major is a fine orange-coloured variety. Flava is a lemon-coloured species. Fulva is a large orange-coloured species of which there is a variegated-leaved variety; both grow 2½ to 3 ft. high and need more room than the others. Kwanso is a double with bronzy flowers; there is a variegated-leaved variety of this also. The Day Lilies may be increased by division in spring.

Hyacinth.—Perhaps the most popular of all pot bulbs. The culture has already been dealt with, and it only remains to give a selection of varieties—

Varieties for Forcing.

White Roman (pot in August and successionally)
Italian, various colours
Dutch Miniature, various colours

Single Pink.

Cardinal Wiseman
Gertrude
Gigantea
Jacques
L'Ornement Rose

Single Red.

Amy
Robert Steiger
Roi des Belges

Single White.

Baroness van Tuyll
La Grandesse
L'Innocence

Single Blush.

Grandeur à Merveille
La Franchise

Single Blue.

Grand Maître, medium
King of the Blues, dark
Queen of the Blues, light
Schotel, light

Single Yellow.

City of Haarlem
King of the Yellows

Doubles.

La Tour d'Auvergne, white
Laurens Koster, blue

It is not necessary to buy first-size named Hyacinths for bedding, as dealers supply special-size bulbs in distinct colours.

Grape Hyacinths (Muscari) are beautiful little plants for cool, shady parts of the rock garden. Botryoides, blue; b. alba, white; and conicum, Heavenly Blue, are all charming. The bulbs may be planted an inch deep and 3 ins. apart in autumn.

Musk Hyacinth (Muscari moschatus), with yellow, musk-scented flowers, is an interesting plant which may be treated like the Muscaris.

The mauve Feather Hyacinth (Muscari plumosus), the blue Starch Hyacinth (Muscari racemosus), and the Amethyst Hyacinth (Muscari amethystinus), may also be grown.

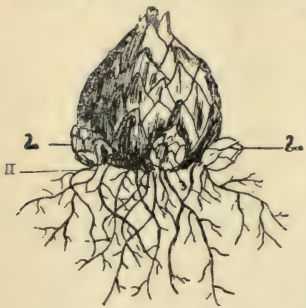
Hyacinthus (*Galtonia*) *candicans*.—This is the noblest of all the Hyacinths, bearing a flower-spike which rises to a height of 4 ft., and a cluster of large, expanded, pendent, bell-shaped flowers. A group of it in a border, or a bed, planted 3 ft. apart and interspersed with the cheap scarlet Gladiolus Brenchleyensis, looks very fine. Both plants will thrive in any well-drained soil, and will probably be at their best in August.

Iris.—*See* Iris.

Ixia.—Pretty, if somewhat artificial-looking, bulbs, well adapted for culture in pots, but also thriving in sunny spots outdoors where the soil is light and well drained. They are useful for a cool greenhouse, succeeding the spring bulbs. Three may be put in a 5-in. pot and given the bulb soil and treatment generally. The leaves are long and slender, like those of Gladioli, and the flowers are borne in Gladiolus-like spikes. The following are pretty varieties:—

Azurea, blue	Lady Slade, pink
Brutus, yellow	Queen of Roses, rose
Bucephalus, carmine	Snowflake, white
Crateroides, scarlet	Viridiflora, green

Lachenalia.—Pretty, graceful, free-blooming bulbs, suited for pot culture, and still more for hanging baskets. Five bulbs could be put in a 6-in. pot, or several 2 ins. apart round the sides of a wire basket lined with moss and filled with bulb soil. They are charming for cool greenhouses, flowering late in spring. The most popular kinds are pendula, red, green, and purple; Nelsoni, yellow; and tricolor, yellow, green, and red.

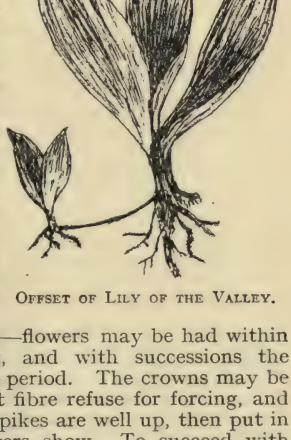


Offsets on Liliums.
1. Fibrous roots. 2. Offsets.

Lilium.—A large and very important genus, giving us beautiful plants for conservatory, greenhouse, and garden; and exquisite flowers for wreaths and table and church decoration. The Liliums are true bulbs, and thrive in the bulb soil already recommended. The only real difference in culture is that as they have a habit of producing roots above the bulb, at the lower part of the stem, it is desirable to place the bulbs rather low in the pots, and give a top-dressing of soil when the stem roots appear. Otherwise they may be treated like Hyacinths. They also do well in bowls or pots of peat-moss fibre and shell. When used for garden decoration Liliums should be given sheltered places. The soil should

be well drained, and if stiff, lightened with road scrapings, leaf mould, peat, and sand. They may be covered twice their own depth. The best varieties for pot culture are speciosum (lancifolium) Kraetzeri, white; speciosum roseum and rubrum, white spotted with red; longiflorum, white; and longiflorum Harrisii, white. The most popular kinds for the garden are auratum, the Golden-rayed Japanese Lily, and its varieties rubro-vittatum, virginale, and Wittei: candidum, the white Garden or Madonna Lily, and its double variety; Chalcedonicum, the scarlet Turk's cap; croceum, the Orange Lily; Martagon, purple, and its white variety; tigrinum, the Tiger Lily, and its varieties Fortunei and splendens. From 3 to 6 bulbs planted a foot apart in groups look well. Candidum ought to be bought towards the end of summer, the others in autumn or spring. Other good Liliums are giganteum, very tall, pure white flowers, likes a cool, moist place; Henryi, orange; pomponium, scarlet; pyrenaicum, the yellow Turk's cap; and sulphureum, pale yellow.

Lily of the Valley (Convallaria majalis).—This deliciously scented old favourite should be grown both outdoors and in. It is of the easiest cultivation, and inexpensive. It may be forced or treated as a simple greenhouse plant with equal success. Those who are satisfied with flowers in April need give no artificial heat whatever. It suffices to put half a dozen "flowering crowns" with the tips exposed in a 5-in. pot in autumn in the bulb soil, plunge them in fibre like Hyacinths, and put them in the greenhouse a few weeks later. They will remain with little or no sign of growth until the warm weather of spring comes, and then will come into bloom rapidly. What is more, the leaves will follow quickly on the flowers. When the crowns are forced in bottom heat the flowers come in advance of the leaves. By getting retarded crowns—that is, crowns kept dormant by cold storage—flowers may be had within a month from starting the forcing, and with successions the supply can be maintained over a long period. The crowns may be put in damp moss or moist cocoa-nut fibre refuse for forcing, and should be kept in the dark until the spikes are well up, then put in the light and potted when the flowers show. To succeed with Lilies of the Valley in the garden it is necessary to choose a moist, shady place. A dressing of peat and leaf mould will improve the soil. It is well to buy special clumps for planting in autumn, not to rely on forced crowns. Fortin's Giant is a fine variety. Berlin crowns are good for forcing.



Offset of Lily of the Valley.

Montbretia.—A quasi-bulbous plant which bulb dealers handle, and which does well if bought and planted in autumn. The Mont-

bretias are very useful, for they will thrive in almost any soil, and while they like a cool, rather shady place, with abundance of moisture, they will grow in most places. They form thick masses of long, narrow, Iris-like leaves, from the midst of which the flower-stems rise. They may be propagated by division in spring. Most of the sorts are yellow or orange in colour, and the flowers are borne in large quantities over a long period. George Davison, yellow; Germania, scarlet; Golden Sheaf, yellow; Pluie d'or, apricot; and Prometheus, orange, are good varieties.

Narcissus.—*See* Daffodil.

Nerine.—A beautiful genus of half-hardy and tender bulbs, suitable for cool houses or for warm, sheltered places indoors in mild districts. The brilliant, glistening flowers are borne in umbels in late summer. Increasing slowly, and being impatient of disturbance, they are rather more expensive than the majority of bulbs, but the rates are not exorbitant. Nerine (Amaryllis) sarniensis, the Guernsey Lily, is one of the most beautiful of the genus, and there is a large trade done in it in late summer, the plants being bought with Roman Hyacinths when the flower-spikes are rising from the bulbs. They make their growth after blooming, and should be watered until they show signs of going to rest in spring, when they should be dried off for the summer. The bulb soil suits them. It is best to leave them in the same pot until they get very crowded, as frequent shifting is bad. The following are beautiful Nerines: Bowdeni, pink; corusca major, scarlet; Fothergilli major, crimson; and Salmon Queen, salmon.

Ornithogalum.—Best known through the pretty white " Star of Bethlehem," O. umbellatum, a fragrant flower often grown on the rockery or near the front of the border, hardy, and thriving in ordinary soil if the bulbs are planted an inch deep and 6 ins. apart; it likes a shady spot. Arabicum, on the other hand, prefers a warm, sunny spot; it is a beautiful and fragrant species, the white flowers having a central boss of shining black. It may be grown in pots for spring flowering, and as it is both pretty and sweet it is worth a place in the greenhouse. Lacteum, white with yellow anthers; and nutans, grey, are also popular.

Pancratium.—A beautiful white greenhouse bulb, with long sepals. It thrives in the usual bulb soil, and may be grown singly in 5-in. or 6-in. pots. Most of the Pancratiums are agreeably scented. Calathina and fragrans, white, sweet, are perhaps the best-known species. Maritimum is also grown a good deal. The last may be grown out of doors in sandy, well-drained soil in a sunny place.

Ranunculus.—This florists' flower has lost some of its old-time favour, and is rarely bedded by florists as was once the case. The flowers are symmetrical and brilliantly coloured, but rather stiff. The Turban class are early bloomers, and may be planted 2 ins. deep and a foot apart, claws downward, in autumn; the French and Persian, which bloom later, may be planted in February or March. They all like a sandy, friable, well-drained soil.

Schizostylis coccinea (scarlet Kaffir Lily).—The great value of this bright little plant is that it blooms in autumn and early winter, when

flowers are scarce. It might be called a miniature Gladiolus, for its leafage and flower spikes resemble those of the Gladiolus; it is, however, much smaller. It is quite hardy, and a few clumps of it look very cheerful in the border on a winter day. They should be given a sunny, sheltered position and left to spread. The Kaffir Lily is well worth growing in pots, and 3 plants put into a 5-in. pot in bulb soil in autumn will enliven the cool greenhouse in winter.

Scilla (Squill).—Bright little bulbs, charming in spring beds or on the rockery. They will grow almost anywhere and bloom early. Plant an inch deep and 6 ins. apart in autumn. They make pretty margins, and also look well in grass. The Scillas come into bloom with the Snowdrops, and make charming companions for those dainty little flowers. Bifolia, dark blue; and Sibirica, bright blue, are pretty dwarf species; and there are white varieties of both. Campanulata, the wood Hyacinth, is a taller plant, and there are now several good garden varieties of it, blue, white, rose, or lavender in colour. Nutans is the English Bluebell, and there are white and pink varieties of it. Peruviana, the Cuban Lily, is a handsome plant, and there are white and pink varieties of this also.

Snowdrop (Galanthus nivalis).—Pretty little hardy bulbs, the Snowdrops never look nicer than when hanging their bells above the grass. They are, of course, good for margins, for colonies near the front of a border, for rockeries, and also for pots. They like a cool, shady spot better than a dry, sunny one; and when they have established themselves they should be left undisturbed. The bulbs may be planted 2 ins. deep and 6 ins. apart. Both the common single and double are good, but Elwesii and plicatus are larger.

Snowflake (Leucojum).—The Snowflakes succeed the Snowdrops, flowering in spring and early summer. Both aestivum and vernum have white flowers tipped with green, and are larger in bloom and taller than the Snowdrops. Vernum is the earlier in flower, and is fragrant. The bulbs may be planted 3 ins. deep and 9 ins. apart, and a shady spot is desirable. One of the finest of all the Snowflakes is Vageneri, which flowers late in spring.

Solomon's Seal (Polygonatum multiflorum).—A distinct and graceful plant, growing 2 to 3 ft. high, thriving in shade, and bearing greenish flowers on a long, arching stem. It is perfectly hardy, and may be planted out in autumn, but many grow it in pots, using bulb soil and forcing it gently.

Sparaxis.—Cape bulbs, somewhat resembling Ixias, but flowering rather earlier, and dwarfer. They are good for rockeries and the front of borders, and thrive when planted in light, well-drained, fertile soil; or they may be grown in pots like Ixias. The species pulcherrima is quite distinct from the others, flowering in autumn and growing several feet high. It is hardy in friable, well-drained soil.

Tigridias.—Short-lived but richly-marked flowers, blooming late in summer. They are fairly hardy, thriving in sandy, friable, well-drained soil in a sunny spot; but not reliable in cold, damp soil. Conchiflora, the shell flower, yellow spotted with red; grandiflora alba, white, spotted; grandiflora rosea, pink; and Pavonia, red with darker spots, are good sorts.

Trillium grandiflorum.—The American Wood Lily is a beautiful and distinct plant, admirably adapted for cool, shady positions in the woodland or wild garden. The flowers are large and pure white, borne in May. The bulbs may be planted 2 ins. deep and 9 ins. apart in autumn.

Triteleia.—Pretty dwarf bulbs, blooming in spring. They are good for rockeries and the front of borders. Uniflora is the best-known species; the white flowers are delicately suffused with lilac and have a pleasant perfume. Violacea is a darker-coloured variety. They may be planted 2 ins. deep and 6 ins. apart in autumn, or grown 3 in a pot, and treated like other indoor bulbs, for flowering in winter under glass.

Tritonia or *Crocosmia.*—The species aurea, which bears long, graceful racemes of orange-coloured flowers in summer, is a bright and popular plant. It is hardy in warm, sunny spots, and in well-drained, friable soil. It is well worth growing in pots for the cool greenhouse, and may be given the general bulb treatment. Crocata is also an orange-coloured species.

Tuberose (Polianthes tuberosa).—A fragrant, pure-white bulb, with long flower stems, which rise in summer. The bulbs are procurable in winter and spring, and should be potted singly like Hyacinths and given the general bulb treatment. They are quite easy to manage. The favourite variety is Pearl, which has double, fragrant flowers that are charming for bouquets, wreaths, and general cut-flower work.

Tulips.—The Tulip grows rapidly in favour every year as a garden flower, and runs the Daffodil an increasingly hard race for supremacy. Its great value lies in the fact that by making a choice of varieties we can have Tulips in bloom from mid-April to June. Moreover, we can have plants with flower stems a foot high, and varieties 3 ft. high. Few flowers have a wider range of colours than the Tulip, but it does not give us blue. It has already been pointed out that the Tulip is very useful for pot culture, and in this respect the early Dutch varieties, beginning with the Duc van Thols, are the most suitable. The method of culture has been indicated. The plants sometimes throw abortive flowers, but this rarely happens with large, well-ripened bulbs, unless there has been a serious error in culture, such as keeping the plants too long in fibre (*see* previous remarks as to potting bulbs), forcing them too hard, or giving insufficient water. It may be remarked that British-grown Tulips are quite as good as Dutch, and the buyer must not be alarmed by loose skins, as they do not affect the flowering. The Tulip differs from the Hyacinth in bulbing freely after flowering, and consequently any good varieties should be kept. If the soil is good, and the season not a very dry one, they are sometimes better the second year than the first. It has been noted (*see* Flower Garden) that there are plenty of plants which may be raised in readiness for planting out in June, so that no one need hesitate to plant late Tulips freely on the ground that they occupy the beds too long. They make noble colour groups in borders. The following are beautiful early Dutch single Tulips, suitable for pots, bowls, and beds:—

Chrysolora, yellow
Cottage Maid, pink, dwarf
Couleur de Cardinal, cardinal
Duc van Thol, red and yellow, also other colours
Joost van Vondel, striped, also white form
Keizer's Kroon, red and yellow, very tall
Ophir d'Or, yellow
Pink Beauty, rose and white
Proserpine, yellow
Thomas Moore, orange
Vermilion Brilliant, scarlet
White Swan, white

The following are good early double varieties:—

La Candeur, white
Rex Rubrorum, red
Salvator Rosa, rose
Tournesol, red and yellow
,, yellow
Yellow Rose, sweet

The following are splendid May bloomers:—

Caledonia, cardinal
Clara Butt, pink
Gesneriana lutea, yellow
Grand Monarque, chocolate
La Merveille, coppery, sweet
La Tulipe noire, purple
Le Rêve, mauve
Loveliness, lilac-pink
Maiden's Blush, white, rose edge
Mrs. Krelage, mauve, white edge
Pride of Haarlem, crimson
Summer Beauty, rose flake
Walter T. Ware, orange

Watsonia.—A small genus of beautiful Cape bulbs, of which two sorts, Ardernei and Meriana O'Brieni, have pure-white flowers. They are worth growing in pots, and may be potted singly, like Hyacinths, but the bulbs are not procurable till early winter. They may be started in pots in spring if desired, and planted out in early summer. The flowers are borne in long, graceful spikes.

Bullace (Prunus insititia).—A fruit hardly worth growing. *See* Fruit—Damsons.

Buphthalmum (buphthāl-mum, from *bous*, an ox, and *ophthalmos*, eye, in allusion to the disk. Ord. Compositae).—These are tall, hardy herbaceous perennials, suitable for the border, and thriving in ordinary well-drained soil in a sunny position. Propagation is by division in spring. The best are salicifolium grandiflorum, speciosissimum (Telekia speciosissima), and speciosum (cordifolium), all of which grow about 2 ft. high and have yellow flowers in summer.

Burgundy Mixture.—This is a substitute for Bordeaux Mixture, and is used for spraying Potatoes in order to keep off blight. Soda is used instead of lime, and the proportions are: 6 lb. sulphate of copper, 7½ lb. washing soda, 50 gallons of water.

Burning Bush, Dictamnus Fraxinella.

Butcher's Broom (Ruscus).—A good shade plant. Ruscus derives from *beus* (Celtic), box, and *kelem*, holly; and the plant is also called the Box Holly. The Butcher's Brooms belong to the order Liliaceae, and grow about a foot high. They are grown as foliage plants.

Butomus umbellatus (Flowering Rush).—*See* Flower Garden—Water plants.

Butterbur, Petasites vulgaris.

Buttercup, Ranunculus bulbosus, etc.

Butterfly Flower, Schizanthus.

Butterwort.—*See* Pinguicula.

Buxus.—*See* Box.

Cabbage.—See Brassica and Kitchen Garden.

Cactus.—Cactus is not a genus, but a class. The term is applied collectively to a number of genera which have a common character, such as Cereus, Echinocactus, Echinopsis, Epiphyllum, Mamillaria, Melocactus, Opuntia, Pereskia, Phyllocactus, Pilocereus, and Rhipsalis. All of these plants are Cacti. The majority of them were originally grouped in one genus, called Cactus, in allusion to the spininess of the first member so named. They are fleshy plants, mostly of slow growth, thriving in a cool, airy house. One or two, notably Epiphyllums, are good room plants. The Cactuses require a plain, gritty soil, such as loam with a good sprinkling of shattered brick and sand. They may be given water in summer when the soil becomes dry, but should be kept with hardly any in winter. They are propagated by seeds, grafting, cuttings, and division. When seeds are available they may be sown in very gritty, porous compost in well-drained pots, preferably in a greenhouse in spring.



GRAFTING AN EPIPHYLLUM ON A PERESKIA STOCK.

The grafts are pinned on with spines from the stock.

Kinds that form stems may be propagated by cuttings of these growths, which should be laid in the sun for a few days to get rid of some of the sap, otherwise they may damp off; they should then be inserted in gritty soil. Species of tufted habit may be divided when the plants are repotted in spring. Epiphyllums are generally grafted on to stocks of Pereskia or Cereus. As natives of arid districts, Cacti are used to a dry atmosphere, but they may have a moist one when growing in summer. The following are some of the principal species:—

Cereus flagelliformis, pink flowers in spring.
,, grandiflorus, white, summer, a night bloomer.
,, Macdonaldiae, white and red, summer.
,, nycticalus, white, summer, a night bloomer.
,, speciosissimus, scarlet, summer.
Echinocactus gibbosus, white, autumn.
,, ,, nobilis, white, autumn.
,, Leeanus, yellow, spring.
Echinopsis cristata, cream, summer.
,, ,, purpurea, purple, summer.
,, Eyriesii, white, summer, sweet.
,, ,, flore pleno, double.
,, Pentlandii, white and red, summer.
Epiphyllum Russellianum, rose, spring.
,, truncatum, rose, spring and summer.

(The latter is a popular Cactus for rooms, and produces its brilliant flowers on the edges of the branches, hence the name, which comes from *epi*, upon, and *phyllon*, leaf. There are several varieties, differing in colour from the original species.

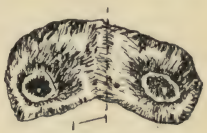
It is generally grafted on to Cereus speciosissimus or Pereskia aculeata, but those who have no stocks may insert cuttings. The plants may be started in a warm greenhouse about mid-winter, put into a cool house in summer, and given very little water in winter.)

Mamillaria crassispina, red, summer.
,, dolichocentra, rose, white spines, summer.
,, echinata, yellow, summer.
,, elongata, yellow, summer.
,, longimamma, yellow, summer.
,, Zuccariniana, crimson, early summer.
Melocactus communis, rose (Melon Cactus).
Opuntia decumana, orange, summer.
,, leucotricha (ursina), white, early summer (Grizzly Bear Cactus).
Opuntia Rafinesqui, red and yellow, summer
Pereskia aculeata, white, autumn (American Gooseberry).
Phyllocactus Ackermannii, crimson, summer.

(There are many hybrids and varieties of Phyllocactus, of which the following are good: Agatha, rose; Brilliant, scarlet; Cooperi, cream; Epirus, pink; Niobe, deep red.)

Pilocereus senilis, white spines and long white hairs (Old Man Cactus).
Rhipsalis Cassytha, green and white, late summer.
,, sarmentacea, white, a good basket plant.

Caladium (calā-dium, from *kaladion*, a cup. Ord. Aroideae).—Except for the species argyrites, these are large-leaved, expansive plants, and need large pots and a roomy house to be done justice to. They are grown entirely for their foliage, which is of great size, borne shield-like on the stems so as to show to advantage, and beautifully coloured. They thrive best in a warm greenhouse in which a humid atmosphere can be maintained. When huddled with other plants in a small, dry house they soon lose their glow. They form tubers, to which they die back in autumn, and from which they start afresh in winter or spring, according to the heat available. Loam (3 parts), leaf mould (1 part), and sand suit them. They may be propagated by division while at rest. Good varieties—



A Caladium tuber.
1. Point of division.

Argyrites (species)	Roncador
Clio	Rose Laing
Duchess of Fife	Silver Cloud

Calanthe (calān-the, from *kalos*, beautiful, and *anthos*, flower. Ord. Orchidaceae).—The Calanthe is one of the most important of all Orchids, because in addition to great beauty it has the advantage of easy culture. It is what is called a "terrestrial" Orchid, that is, it is grown in soil, not on blocks. Most of the species are evergreen, but vestita is deciduous. One of the most valuable traits is the long duration of the flowers, and fortunately this quality is retained

when the spikes are cut and put in water. The deciduous kinds rest in winter, when no more water should be given than is required to keep the pseudo-bulbs fresh. The plants may be started into fresh growth in a warm house towards the end of winter, when they should be repotted. The pots should be filled up to one-third their depth with crocks, and the remainder with loam, leaf mould (or peat), and Sphagnum moss in equal parts, the whole lightened with sand and broken charcoal. The material should be filled in nearly to the brim, and the plants set on the top. This plan allows a free run to the strong roots. The plants must have a light place, and be kept moist in a temperature of 65° to 75°. When the pseudo-bulbs are full grown they may go in a cooler, drier house. Propagation is by division of the pseudo-bulbs when repotting. The following are the principal species and varieties:—



A Calanthe Tuber.
1. Drainage.
2. Compost.

Masuca, violet, winter bloomer; Veitchii, rose, winter (syn. Limatodes rosea); veratrifolia, white, spring; vestita, pink and white, winter.

There are several good varieties of the last, notably nivalis, white; oculata gigantea, white, red blotch on lip; and rubro-oculata, crimson and white. There are also varieties of Veitchii.

Calceolaria (calceolā-ria, from *calceolus*, a slipper, referring to the form of the flower. Ord. Scrophularineae).—There are two distinct types of Calceolaria, the herbaceous and the shrubby. The former dies back to the roots at the end of the growing season, the latter holds its stems and leaves. Herbaceous Calceolarias are generally grown as annuals, fresh batches being raised from seed every year. The principal seedsmen have raised beautiful strains, which form large plants under good culture, covered with large, richly-coloured pouches. The seed is somewhat expensive, and being small should be handled with care (*see* Begonias, and Watering). It may be sown in spring. When the seedlings are fairly started they grow rapidly, and may be repotted till they have 6-in. or 7-in. pots, in which they may bloom. They will be safe in an airy frame or cool greenhouse in summer, and may be given a warm greenhouse in autumn if early bloom is required, otherwise they will do in a cool greenhouse. The ordinary shrubby Calceolaria is the dwarf yellow which is often used in flower gardening. It is a brilliant plant, nearly hardy, but is subject to disease, which carries off large numbers in summer. It should be planted a foot apart in April, and sprayed (*see* Bordeaux Mixture). Cuttings of the young shoots may be taken in October, and put in sandy soil in a cold frame, over which a mat may be thrown in cold weather in winter. Golden Glory is the best variety. Several hybrid, yellow-flowered Calceolarias of more vigorous growth than the bedders have been raised, and they are useful for flowering in greenhouses and conservatories in autumn, winter, and spring. Clibrani is a particularly good one, blooming profusely and being very bright.

Burbidgei is also good. They are of rambling habit, and make large, showy plants.

Calendula (Marigold).—*See* Annuals.

Calla (cāl-la, from *kalos*, beautiful. Ord. Aroideae).—Much the most important plant in this genus is the Arum Lily, often called Calla aethiopica, but now called by botanists Richardia africana. *See* Arum Lily and Bulbs.

Calliopsis (calliōp-sis).—*See* Coreopsis and Annuals.

Callistemon, Bottle Brush (callistē-mon, from *kalistos*, most beautiful, and *stemon*, stamen, in allusion to the long scarlet stamens).—Singular and attractive evergreens, suitable for a cool house, but must be kept safe from frost in winter. The close spikes, with their long stamens, have gained the popular name of Bottle Brush. The plant enjoys a compost of peat and loam in equal parts, with sand. It may be propagated by cuttings inserted in sandy peat in late spring. The principal species are lanceolatus (syn. semperflorens, also called Metrosideros citrina and M. semperflorens) and speciosus (also called Metrosideros speciosa), both of which have crimson flowers.

Callistephus (callistēph-us, from *kalistos*, most beautiful, and *stephanos*, crown).—The China Aster, C. hortensis (syn. chinensis) is offered by some seedsmen under the name of Aster sinensis, and is well worth growing, as it produces large blue flowers freely in summer. It should be grown as a half-hardy annual. *See* Annuals.

Calluna, Ling, Heather (callū-na, from *kalluno*, to adorn. Ord. Ericaceae).—The common Ling or Heather is Calluna vulgaris, a British plant with purplish flowers. It is well known as a wilding, but its varieties, alba, white; Hammondi, white; pygmaea, dwarf; argentea, silvery leaves, are more esteemed for gardens. They like peaty soil, but will grow in most good garden soils. Propagation is by cuttings. For the best Heaths, *see* Erica.

Callus.—A swelling at the base of a severed shoot, which springs from the cambium layer at the junction of bark and wood. It is the precursor of rooting. Gardeners speak of cuttings " callusing."

Calochortus (calochōr-tus, from *kalos*, beautiful, and *chortus*, grass, in allusion to the slender leaves. Ord. Liliaceae).—*See* Bulbs.

Caltha, Marsh Marigold (cāl-tha, from *kalathos*, a goblet. Ord. Ranunculaceae).—The Marsh Marigold is a useful waterside plant, and several good garden forms are procurable, such as bicolor, white; monstrosa flore pleno, large double; and nana flore pleno, dwarf double. They thrive in moist soil, and are increased by division in spring.

Calycanthus, Allspice (calycān-thus, from *kalyx*, calyx, and *anthos*, flower, referring to the coloured calyx).—These plants are fragrant both in bloom and leaf. The brownish flowers of C. floridus are not conspicuous, but they are deliciously fragrant. They are borne in June. It is illustrated in the *Botanical Magazine*, t. 503. There are several varieties of it, of which asplenifolius and variegatus are

two of the best. Occidentalis, which bears red flowers in August, is also very sweet. These plants are nominally hardy in Great Britain, but it is best to give them a sheltered place in a shrubbery or near a wall. They like peaty soil, but are not fastidious. Propagation is by layering in summer, or by seeds in a frame. The plant sometimes grown under the name of Calycanthus praecox is Chimonanthus fragrans.

Calystegia, Bearbind, Bindweed (calystē-gia, from *kalyx*, calyx, and *staga*, a covering, from the calyx being obscured by bracts. Ord. Convolvulaceae).—While some of these relatives of the Convolvulus have beautiful flowers, notably hederacea (pubescens), with rosy flowers in early summer; and sepium dahurica, with rosy purple flowers in summer, the genus as a whole must be regarded with suspicion. When the common Bindweed gets a footing in a garden it is apt to become a nuisance, twining round many plants which would look much better without it. The best way of keeping it under is to chop off the shoots as fast as they appear above ground; if, however, the root can be traced it should be pulled out altogether. The Calystegias may be propagated by division in spring, or by seeds.



GRAFTING CAMELLIAS.
Camellias may be propagated by grafting in spring if the base of the scion is inserted in a bottle of water.
1. Stock. 2. Scion.

Camassia (camāss-ia, from *Quamash*, the Indian name. Ord. Liliaceae).—*See* Bulbs.

Camellia (camāll-ia, after Camellus, a Moravian. Ord. Ternstromiaceae).—One of the noblest of our evergreen shrubs, the Camellia is so nearly hardy that it may be grown in cool houses in northern climes, and outdoors in warm, moist, southern districts of England. It is a beautiful plant, its habit being bushy and compact, its leaves glossy, its flowers symmetrical, substantial, and of brilliant colours. The white varieties are quite wax-like in texture. The double Camellias are the most popular. The one serious difficulty with the Camellia is its habit of casting its flower buds, which it does on very slight provocation. The trouble is less serious with planted-out than with pot plants, and probably turns on correct watering (*see* Watering). Turfy loam and peat in equal parts, with broken charcoal and sand, suit as compost. The plant makes its growth after flowering. Propagation can be effected by striking young shoots in sandy soil in a shaded frame in July. Grafting, layering, and inarching are practised in the nurseries. Repotting should never be done with



PROPAGATING CAMELLIAS BY CUTTINGS.
The cuttings may consist of matured young wood, and be inserted in summer in bottom heat.

established plants until the pots are quite full of roots, and then it is best done directly the buds set. Large plants in borders may be pruned into shape after flowering. Good varieties—

Alba plena, white; Comtessa Lavinia Maggi, white, carmine stripes; C. M. Hovey, crimson; Donckelaari, crimson and white; Lady Hume's Blush, flesh; Marchioness of Exeter, rose.

Campanula, Bell Flower (campān-ula, from *campana*, a bell, in reference to the form of the flower. Ord. Campanulaceae).—A large and valuable genus, giving good material alike for greenhouse, border, and rockery. The Canterbury Bell is a Campanula (C. medium), and this, with C. pyramidalis, is best treated as a biennial (*see* Biennials). Both of these beautiful kinds may be grown in pots. The best of the border Campanulas other than the Canterbury Bell are as follows:—

carpatica, blue, early summer, 9 ins. high.
,, alba, white, early summer, 9 ins. high.
,, venusta, lavender, early summer, 9 ins. high.
glomerata, blue, early summer, 18 ins. high.
,, dahurica, blue, early summer, 18 ins. high.
latifolia, blue, early summer, 24 ins. high.
,, macrantha, blue, early summer, 24 ins. high.
persicaefolia, blue, early summer, 24 ins. high.
,, alba plena, double white, 24 ins. high.
Trachelium, blue, summer, 3 ft. high.

All of these are readily raised from seed sown out of doors in May, and most of them may be propagated by division in spring. They will thrive in ordinary well-drained soil. Pyramidalis and its white variety should be sown in spring for pot work, pricked off, potted singly in 3-in., shifted to 6-in., and wintered in a greenhouse. The species fragilis (syn. Barrelieri), with blue flowers in summer; and isophylla, blue, summer, are nice basket plants. The white variety of the latter is even prettier than the blue. For rockwork, carpatica and its varieties; garganica and its variety hirsuta; portenschlagiana (syn. muralis) and the Bavarian variety; Allionii, pulla and the variety G. F. Wilson, pusilla and Raineri, may be chosen. *See* Flower Garden.

Campion.—*See* Agrostemma, Lychnis, and Flower Garden.

Canary Creeper, Tropaeolum aduncum or canariense (Ord. Geraniaceae).—A pretty yellow-flowered creeper, which comes in useful for verandahs, palings, window-boxes, balconies, and other places. Although a perennial it answers well to treatment as an annual. It is generally raised under glass in March and planted out in May, but if the soil is friable and the position sheltered, it may be sown out of doors at the end of April, and will flower in summer.

Candytuft.—The pretty white, carmine, crimson, and other Candytufts which we grow as hardy annuals (*see* Annuals) are the offspring of Iberis coronaria and I. umbellata. The latter is a very old plant, a native of Spain, and bears purple flowers. It is illustrated in the *Botanical Magazine*, t. 106. The Candytufts are among the best of the hardy annuals.

Canker.—One of the commonest diseases of fruit trees, canker is particularly destructive to Apples. It attacks young as well as old trees of certain varieties, and in particular soils. For remedies, *see* Apple. The following mixture of chemical fertilisers has been found good when spread under the trees in February and pointed in: 12 parts superphosphate, 10 parts nitrate of potash, 8 parts sulphate of lime, 4 parts common salt, 1 part sulphate of iron; use 4 oz. per square yard.

Canna (cān-na (Celtic), a cane. Ord. Scitamineae).—The Canna grows in favour more rapidly as a greenhouse than as an outdoor plant. It is perhaps less used now in the garden because "sub-tropical" gardening has given place to the culture of hardy herbaceous plants. The new dwarf forms have finer flowers than the old race, and make really beautiful plants in 7-in. pots. They develop large spikes of brilliant flowers at about 2 ft. high, and the rich colours are well set off by the abundant and handsome foliage, which in some varieties is brown, and in others green. These varieties may, of course, be planted out in beds if desired. They should be started in pots, and planted out 2 ft. apart in deep, rich soil towards the end of May. They enjoy weekly soakings of liquid manure. Young plants started in spring, and put in 6-in. pots in a compost of loam (3 parts), leaf mould (1 part), and sand, will bloom well by midsummer, but with more heat the roots can be started earlier and flowered by the end of May. When the plants die away in autumn the root stocks can be stored in a dry, frost-proof place like Dahlias. They may be divided when growth starts if more plants are required. Good varieties—

Africa, scarlet; Charles Naudin, salmon; Elizabeth Hoss, yellow, spotted; Hermann Fischer, vermilion; Italia, orange and yellow; Souvenir de A. Crozy, scarlet, yellow edge; Van der Schoot, yellow, spotted.

Canterbury Bell.—See Biennials and Campanula.

Cantua (cān-tua, from *cantu*, a Peruvian name. Ord. Polemoniaceae).—Cantua buxifolia (dependens) is a handsome greenhouse evergreen, growing 4 to 6 ft. high, and bearing rosy flowers in spring. It thrives in a sandy mixture of peat and loam, and may be propagated by cuttings under a bell-glass.

Cape Gooseberry.—*See* Physalis.

Cape Jasmine.—*See* Gardenia.

Caper Spurge.—*See* Euphorbia Lathyris.

Capparis (cāp-paris, from *kabar*, caper (Arabic). Ord. Capparideae).—This genus is not important from the garden point of view, but it has economic value, as the species spinosa yields the commercial "capers." It has white flowers, and may be grown in a greenhouse in peat and loam if desired. Propagation is by cuttings of mature wood, inserted in sandy soil under a bell-glass.

Capsicum.—*See* Kitchen Garden.

Cardamine, Lady's Smock (cardamī-ne, from *kardamon*, watercress, on account of the hot flavour. Ord. Cruciferae).—The

common Lady's Smock, with its white or lilac flowers ("lady's smocks, all silver white"), is Cardamine pratensis. Garden lovers prefer the double white. They grow about 18 ins. high and bloom in May. C. diphylla (Dentaria diphylla of the older botanists) is also pretty. It bears white flowers in May, and grows about 18 ins. high. They like moist soil in a cool spot, and may be propagated by division.

Cardinal Flower, Lobelia cardinalis.

Cardoon.—*See* Kitchen Garden.

Carex, Sedge (cā-rex, from *keiro*, to cut, in allusion to the sharp edges. Ord. Cyperaceae).—One or two of the Carexes are good for growing in pools among Water Lilies, and the species Pseudocyperus may be mentioned particularly in this connection. It has triangular stems, and grows about 3 ft. high. Plant at the same time as the Water Lilies. *See* Flower Garden.

Carnations, Picotees, and **Pinks.**—Whether represented by the huge-bloomed, long-stemmed, highly perfumed American Carnations; the fragrant Malmaisons; the flaked flowers beloved of old-time florists; the Cloves of the border; or the Pinks of the cottage garden, this lovely genus wins our admiration and love. Carnations, Picotees, and laced Pinks have sprung from Dianthus caryophyllus, and the common white Pink from Dianthus plumarius. Carnations have been specialised for hundreds of years, and it would be difficult to trace their upward progress from the small, irregular early forms to the large, symmetrical varieties which we have to-day. Florists have worked patiently on them for century after century, with the result that we have at our command an almost embarrassingly rich assortment of lovely varieties.

Garden Carnations.—The best garden Carnations are drawn from the self or one-coloured class, the modern representatives of which combine perfect form with brilliant colours and (in many cases) delicious scent. Would that we could add freedom from insects and fungi, but the truth is that modern Carnations, whether from over-fertilisation, excessive propagation, or unnecessary coddling under glass, are not constitutionally vigorous. It is best to start with a collection of young, clean plants in spring, and plant them in deeply tilled but not heavily manured soil. Friable, well-drained, sandy loam is the best; should the soil be stiff and heavy it will be wise to crumble it well by digging after frost, and adding road scrapings, mortar rubbish, and ashes, both of wood and coal. If the soil is rich the plants had better be set 18 ins. apart. Neat flower stakes must be put to the plants as the flower stems rise, and care must be taken not to bind stem and stake tightly. The plants may be grown in beds or in border clumps. Where there are several beds to fill one might well be devoted to Carnations and Picotees, for the plants will be more varied, and more interesting the summer through, than Geraniums or Begonias, if less brilliant at a particular season. It must be remembered that the plants are evergreen, and as long as they are healthy they are attractive.

Diseases.—Unfortunately, the beauty of the silvery foliage is

often marred by fungi, which cause dark blotches, rusty patches, and shrivelling. The remedy is to spray the plants with water in which fresh liver of sulphur has been dissolved at the rate of half an ounce per gallon, and this must be done at the first sign of attack. Ill-health may arise from underground enemies, such as wireworm, leather-jacket grubs, and surface caterpillars, but an attack from this source is generally shown in puny growth rather than patched leaves. Traps of Potato and Mangel slices may be set among the plants to draw off the grubs. The pieces should be impaled on sticks and examined frequently. Unwonted pallor in summer may be due to a maggot which works within the stems; its burrow should be found and well probed with a long needle.

Propagation.—If the plants are healthy and the soil good they will produce strong, non-flowering side shoots, which can be turned into separate plants by making a slit along the stem a few inches from the root stock in August, and pegging them into a small heap of sandy soil. In 6 or 7 weeks, when they have rooted freely, the young plants may be severed from the old ones and planted out. It is, however, well to put a reserve into small pots and winter them in a cool frame, giving them plenty of air in fine weather. They may prove useful in filling gaps in spring.

Summer show Carnations.—A good garden self Carnation is often a good show variety too, but so high is the standard of exhibition quality which has been reached that it is almost impossible to attain to it without growing the plants in pots, and giving them the shelter of glass. A light, airy pit or greenhouse is desirable; and a brisk, lively atmosphere must be maintained. With a close, warm air the plants would fall a prey to disease. Loam, with a quarter of decayed manure and a liberal dash of sand, makes a good compost. Two plants may be grown in a 7-in. or 8-in. pot, and each restricted to one flower stem, the buds on which may be thinned to three.

Winter and spring Carnations.—There are 3 sections of winter and spring Carnations: the Tree, the American, and the Malmaison. The Tree or Perpetual is less popular than it was, the larger flowers, longer stems, and richer fragrance of the Americans having brought this class (which is really a glorified Tree) into greater favour. The culture is practically the same, as both kinds are raised from cuttings in spring in a warm house or frame, potted as required, grown under cool, airy conditions through the summer, and flowered in gently heated houses the following winter. They may be grown singly in 5-in. or 6-in. pots, in a similar compost to that recommended for show varieties. They should be staked as needed, watered regularly in summer and as required in winter, and given weak liquid manure twice a week when coming into bloom. The Malmaisons are given substantially the same treatment, but they are not so accommodating as the others, and are easily upset by a mistake in watering or ventilating. On this account they are not much grown in mixed collections of plants, but are left to large establishments where a separate house can be devoted to them, and they can be put in charge of a skilled man.

Carnations from seed.—In days when there is not much trouble

from disease it is not every Carnation lover who will bind himself to named varieties, propagated vegetatively by layers or cuttings; many prefer to trust to seedlings, which, if they do not produce flowers of the highest quality, judged by the exhibition standard, are nevertheless beautiful and sweet. It is a good thing to sow a packet of seed from a reliable florist in spring, using sandy, friable soil, and aiding germination with gentle bottom heat. In due course the seedlings are pricked off, hardened in an unheated frame, and then planted out 9 ins. apart in a spare bed. In September they are treated like newly-rooted layers: *i.e.*, planted out or potted for the winter. A sowing of hardy border mixtures may be made out of doors in June, with the Wallflowers and other biennials.

Propagation of Pinks.—Garden Pinks are propagated by pulling young shoots from the old plants and inserting in moist, sandy soil in summer. They are hardy, healthy, and will thrive in almost any soil with the simplest treatment. The laced Pinks are more delicate, and need careful Carnation treatment; they are declining in favour. The following are selections in the various colours:—

Self Carnations for Border and Show.

Banner, scarlet
Bendigo, purple
Ben Ghazi, crimson
Exile, rose
Firebrand, scarlet
Garville Gem, heliotrope
Gil Polo, crimson
Hildegarde, white
Lady Hermione, salmon-pink
Lady Nina Balfour, peach
Lord Roberts, yellow
Miss A. Campbell, primrose
Mrs. Eric Hambro, white
Queen of Bedders, pink
Seagull, blush
Trojan, white
Uriah Pike, crimson, clove-scented

Bizarre and Flake Carnations for Show.

Admiral Curzon, scarlet bizarre
Robt. Houlgrave, scarlet bizarre
Master Fred, crimson bizarre
Rifleman, crimson bizarre
Sarah Payne, pink and purple bizarre
Wm. Skirving, pink and purple bizarre
Gordon Lewis, purple flake
James Douglas, purple flake
Alisemond, scarlet flake
Rob Roy, rose flake
Thalia, rose flake

Picotees for Garden or Show.

Brunette, heavy red-edged
J. B. Bryant, heavy red-edged
Charlotte Brontë, medium red-edged
Mrs. Gorton, light red-edged
Thomas William, light red-edged
Mrs. Payne, heavy rose-edged
Clio, medium rose-edged
Ethel, light rose-edged
Favourite, light rose-edged
Chancellor, heavy purple-edged
Zerlina, heavy purple-edged
Amy Robsart, medium purple-edged
Ann Lord, light purple-edged

Tree.

Deutsche Brant, white
Mdlle. T. Franco, pink
Uriah Pike, crimson
Wm. Robinson, scarlet

American.

Beacon, scarlet
Britannia, scarlet
Carola, dark crimson
Enchantress, pink
Lady Bountiful, white
Lady C. Waring, yellow

May Day, pink
Mrs. Burnett, salmon
Winsor, soft rose
White Enchantress

Garden Pinks.

Anne Boleyn, purple
Ascot, pink
Ernest Ladhams, blush
Mrs. Sinkins, white

Yellow Ground Carnations and Picotees.

Brodick
Childe Harold
Gertrude
Gronow
Hidalgo
Lucy Glitters
Rabelais
The Pilgrim

Carnations from Seed.

Double Border, mixed colours.
Grenadin, a type growing about a foot high, scarlet flowers.
Marguerite, a mixed type, single and double, flowering the same year if sown in a warm place in late winter.
Perpetual Prize or Self, saved from exhibition varieties.

Carpenteria californica (carpentēr-ia, after Professor Carpenter. Ord. Saxifrageae).—A beautiful evergreen shrub, which produces large, white, fragrant flowers in June. It may be grown out of doors in northern climes if it can be given the shelter of a wall, otherwise it must be kept in a greenhouse. It is well worth planting out in a large conservatory. It is not particular as to soil, and may be propagated by cuttings. A plate will be found in the *Botanical Magazine*, t. 6911.

Carpinus, Hornbeam (carpī-nus, from *car*, wood (Celtic), and *pix*, head; the wood was used to make yokes. Ord. Cupuliferae).—The Hornbeam, C. Betulus, of which there are several varieties, is used as a hedge plant, particularly by nurserymen, who find its fast growth, and habit of holding its leaves, useful for getting divisional shelters quickly. It thrives in most soils, and is easily increased by seeds, suckers, or layers.

Carpocapsa pomonella (carpocāp-sa), the Codlin Moth.—*See* Fruit.

Carrot, Daucus (dāū-cus) carota.—*See* Kitchen Garden.

Cassandra (cassān-dra, mythological. Ord. Ericaceae).—Allied to Andromeda. The shrubs often called Andromeda angustifolia and H. calyculata are now classed as Cassandras, the former being considered a variety of the latter. They are North American shrubs, growing about 2 ft. high, and producing white flowers in spring. They like a peaty soil.

Cassia (cāss-ia, from *kasian*. Ord. Leguminosae).—The best-known species is corymbosa, which produces yellow flowers in early summer. It is an evergreen shrub about 3 ft. high, and requiring a warm greenhouse or conservatory (*see* the *Botanical Magazine*, t. 633). Loam, with a third of leaf mould and some sand, suits. Propagation is by seeds or cuttings in spring. There are many other species, and some yield the senna of commerce.

Castanea, Chestnut (castā-nea, from the Thessalian town. Ord. Cupuliferae).—The Horse Chestnut is one of our most beautiful trees

when in full bloom, and there are several varieties (*see* Aesculus). The Sweet Chestnut is Castanea sativa, and its nuts are much esteemed. They will keep a long time if stored in dry sand, and are very tasty when roasted. There are several varieties, differing in the form and colour-marking of the leaves.

Castor-oil Plant.—*See* Ricinus.

Catalpa (catăl-pa, the Indian name. Ord. Bignoniaceae).—Handsome trees, of which the North American species bignonioides is the most important. It is a tree growing 20 to 30 ft. high, and bearing white, purple-spotted flowers in July. There are several varieties, including one with yellow and another with silver-variegated leaves. It is a good town tree, as it does not grow to a great size, or run immoderately at the root, yet the head has a nice spread and the flowers are pretty. It is not particular as to soil, and will grow near towns. Propagation is by seeds in spring or layers in autumn. Cordifolia (speciosa) and Kaempferi are two other good hardy species.

Catananche (catanān-che, from *katanangke*, in reference to its use in love-potions, hence also the name Cupidone, under which it is sometimes grown. Ord. Compositae.)—Caerulea, blue; and its blue and white variety bicolor, are hardy herbaceous perennials, growing 2 to 3 ft. high, and flowering in summer. The flowers are dried for winter use. They are not particular as to soil, and may be propagated by seed or division.

Catasetum (catasē-tum, from *kata*, downward, and *seta*, a bristle, in allusion to the position of the horns of the column. Ord. Orchidaceae).—A large but not very important genus of hothouse Orchids, generally grown on blocks or in baskets, but also available for pot culture in crocks and a fourth of peat and some Sphagnum moss. They should be given a good deal of water while growing, but when growth is completed they should receive very little. Propagated by division when fresh growth starts. They want abundance of heat and moisture in summer. The most popular species is Bungerothii, which has white flowers; there are several varieties of it. Macrocarpum and splendens, with their varieties, are also esteemed.

Catchfly.—*See* Silene.

Caterpillars.—Caterpillars, hatching from the eggs of certain butterflies and moths, are very destructive to many kinds of plants. Several kinds attack fruit trees (*see* Fruit), while others infest green vegetables (*see* Kitchen Garden). Dusting them with Hellebore powder is a simple means of destroying caterpillars on bushes of small size. Hand-picking and syringing with brine may be resorted to. Birds eat large quantities of caterpillars, and should be encouraged in gardens.

Cattleya (cătt-leya, after Mr. Cattley. Ord. Orchidaceae).—One of the most important genera of Orchids, giving noble flowers of beautiful and varied colours. They may be grown either in pots (alternatively pans) or baskets. In the former case the pots should be nearly filled with fibrous peat, Sphagnum moss, and crocks, and the plants set on the top. The pots may be 3 parts filled with

crocks to begin with, then the plant should be set on a layer of moss, and the roots packed in with peat and Sphagnum in the proportion of 2 and 1 respectively. Repotting may be done every other year, and the best time is when roots begin to push from the young growths. They like a winter temperature of 55° to 65°, and a spring heat of 60° to 70°. An airy house is required, with light shade in summer. They must have abundance of water while growing, but only enough to prevent the pseudo-bulbs from shrivelling in the resting period. They may be increased by division when fresh growths start. There is considerable variation in height and habit among Cattleyas. Of recent years many hybrids have been raised, both specific and generic. Cattleyas have been crossed with Laelias, and also with Brassavolas (*see* Brassocattleya and Brassocatlaelia). The following are the principal species; for the hybrids, of which there are large numbers, specialists should consult a standard book on Orchids:—

Aclandiae, 6 ins. high, late spring.
citrina, 6 ins. high, spring.
intermedia, 15 ins. high, spring.
labiata vera, 12 ins. high, autumn.
Lawrenceana, 9 ins. high, spring.
Loddigesii, 15 ins. high, late summer.
Mendelii, 15 ins. high, late spring.
Mossiae, 15 ins. high, late spring.
Schilleriana, 6 ins. high, spring.
Skinneri, 10 ins. high, spring.
Trianae, 15 ins. high, winter.
Warscewiczii (gigas), 15 ins. high, early summer.

Cauliflower.—*See* Brassica and Kitchen Garden.

Ceanothus (ceanō-thus, from *keanothus*. Ord. Rhamneae).—Beautiful shrubs, the most useful of which are the hardy deciduous kinds, such as americanus, white, and its variegated variety; azureus, blue, and its fine variety Gloire de Versailles; dentatus, blue; and Veitchianus, blue; inasmuch as they can be utilised for house walls. All flower in late spring or early summer. They like a sunny aspect, and ordinary soil that is not heavy and damp. They may be planted in autumn or late winter. Propagation is by layers, or by cuttings of side shoots in sandy soil under a bell-glass in August. Few wall plants are capable of making a more charming picture on a dwelling than a healthy Ceanothus.

Cedar, Cedrus (cē-dar, cē-drus, from *kedron*, or from *Cedron*, a brook in Judea. Ord. Coniferae).—The Cedar of Lebanon is Cedrus Libani, an impressive tree. The Mount Atlas Cedar is C. atlantica; and the Deodar or Indian Cedar is C. Deodara. All are handsome, and not the least so is atlantica, which has a pyramidal habit. There are several horticultural varieties of each of the species named. A deep, well-drained sandy soil is best. Stiff, cold clay is unsuitable.

Celandine.—The Greater Celandine is Chelidonium majus, and the Lesser Celandine is Ranunculus Ficaria. Both are British wildings.

Celeriac, Turnip-rooted Celery.

Celery, Apium (ā-pium) graveolens.—*See* Kitchen Garden.

Celmisia (celmīs-ia, after Celmisius, a mythological being. Ord. Compositae).—The species coriacea is not infrequently grown as a hardy herbaceous plant. It will thrive in ordinary soil, and produce white and yellow flowers. Holosericea, white, yellow centre, is pretty. Cover with glass in winter. Propagation is by seeds or division in spring.

Celosia (celō-sia, from *kelos*, burnt, in allusion to the scorched appearance of the flowers. Ord. Amarantaceae).—The two most popular members of this genus are cristata, the Cockscomb; and the feathered sub-variety, plumosa. They are greenhouse annuals, generally grown in pots, but plumosa, red, and its yellow form, aurea, are sometimes used in flower-beds in summer. These two are really sub-varieties of cristata pyramidalis, the pyramidal Cockscomb. They should be sown under glass in late winter, pricked off, potted singly, and planted out in June. If kept in pots they may be transferred to 6-in., or for large plants to 5-in. and then to 8-in. They should be kept warm and moist, and have weekly doses of liquid manure, till the flowers show, when they may go into a conservatory or "flowering house." The Cockscomb is grown in practically the same way. If the plants come leggy they may be decapitated with a few inches of stem and struck in sandy soil after the head has formed if they are kept close in a warm place under a hand-light. With dwarf plants the combs curl inwards until the tips nearly reach the side of the pot. They like a compost of loam with a little leaf mould or decayed manure, and sand.

Celsia (cēl-sia, after Professor Celsius. Ord. Scrophularineae).—A small genus allied to Verbascum (Mullein). The best-known species is Arcturus, a half-hardy shrub growing about 4 ft. high, and bearing yellow flowers in August (*see* the *Botanical Magazine*, t. 1962). It may be propagated by cuttings of the young wood in a greenhouse. Cretica is a half-hardy biennial, with yellow flowers in July, and may be raised from seed in a greenhouse in spring.

Centaurea (centāū-rea, from *centaur*. Ord. Compositae).—Inasmuch as this genus gives us the Cornflower and the Sweet Sultan it is one of much interest. C. Cyanus is the Cornflower, and there are several colours in addition to the popular blue. This is a hardy annual, and may be grown as such (*see* Annuals). Moschata is the purple Sweet Sultan, of which seedsmen offer white and yellow varieties; the latter is called odorata by some botanists, thus making it a distinct species from the purple. Grow as hardy annuals. Depressa is a dwarf blue annual species. The most useful of the perennial species are Cineraria, otherwise Cineraria candidissima, which is grown for its silvery leaves, and is raised from seed in heat in spring; macrocephala, a tall yellow perennial; and montana, blue, 2 ft. high; the white variety of the latter is a good border plant, hardy and free-flowering, but needs careful tying, as its habit is straggly. Ragusina used to be grown a good deal for its silvery leaves, but Cineraria maritima is a better plant. The hardy

perennials grow in ordinary soil, and are propagated by division in spring.

Centranthus, Valerian (centrān-thus, from *kentron,* a spur, and *anthos,* a flower, in allusion to the spur at the base. Ord. Valerianeae).—The Valerians are bright and free-blooming plants. Macrosiphon, red; and albus, its white variety, are two good hardy annuals, which grow about 2 ft. high and bloom in summer. Ruber (Valeriana rubra) is the common red Valerian, a hardy perennial often naturalised on chalky cuttings in Great Britain. It increases itself by self-sown seeds, and must be kept in hand, or it will spread too much. There is a white variety. Both will establish themselves on walls if a few seeds are dropped into crevices.

Centropogon (centropō-gon, from *kentron,* a spur, and *pogon,* a beard, in allusion to the fringe round the stigma. Ord. Campanulaceae).—The one member widely grown is Lucyanus, a hybrid growing 2 ft. high and bearing rosy flowers in autumn. It may be grown in a warm greenhouse in equal parts of loam and peat, and propagated by cuttings of the young shoots in bottom heat under a bell-glass, using sandy soil.

Cephalaria (cephalā-ria. Ord. Dipsaceae).—An unimportant genus, except for the one species alpina (Scabiosa alpina), which grows about 5 ft. high, and produces yellow flowers in summer. It will grow almost anywhere, and may be propagated by seed.

Cerastium (cerās-tium, from *keras,* a horn, referring to the shape of the seed vessel. Ord. Caryophylleae).—The Mouse-ear Chickweed is useful as a carpeter, and may be grown on the rockery where there is room for it to spread without encroaching on more delicate plants. It will thrive in almost any soil, and seeds freely, springing up in all directions. The two species Biebersteinii and tomentosum are much alike, and both may be increased by cuttings or division in spring where a good many plants are wanted; or the self-sown seedlings may be transplanted. They have white flowers as well as silvery leaves. They may be sown on walls, and are useful as edgings.

Cerasus, Cherry (cēr-asus, from the town of that name in Asia. Ord. Rosaceae).—The genus Cerasus is now put under Prunus by botanists, but nurserymen and gardeners grow certain species under the old generic name, notably avium (dulcis or domestica), the wild Gean; Cerasus, the common Cherry; Laurocerasus, the common Laurel; lusitanicus, the Portugal Laurel; Padus, the Bird Cherry; Pseudo-cerasus; and serrulata. There are several good varieties of each. Multiplex, double; pendula, weeping; and laciniata, cut-leaved, are varieties of avium. Rhexii flore pleno is a good ornamental variety of Cerasus. Argentea is a nice variety of the Bird Cherry. Watereri, a double form, represents Pseudo-cerasus, and may be grown in large pots to be gently forced in winter. The others may be grown in the shrubbery, where they may be planted in autumn, preferably in light, well-drained soil. The special varieties are propagated by budding and grafting. For fruiting Cherries, *see* Fruit.

Cercis, Judas Tree (cēr-cis, from *kerkis*, a shuttlecock, so named by Theophrastus. Ord. Leguminosae).—Among the several trees on which Judas Iscariot is reputed to have ended his life is Cercis siliquastrum, a native of Southern Europe, which produces purplish-red flowers in May (*see* the *Botanical Magazine*, t. 1168). The flowers are attractive, and the tree is worth planting in the flower garden, but in cold districts it should be given a sheltered place.

Cereus.—*See* Cactus.

Cestrum (cēs-trum, an old Greek name. Ord. Solanaceae).—Allied to Habrothamnus. The most popular species is aurantiacum, a warm-house shrub which produces orange flowers in early summer, and may grow to 5 ft. high. It looks well against a wall or pillar. Loam, with a little peat and some sand, suits. Propagation is by cuttings in sandy soil in spring. Prune after flowering.

Ceterach (cēt-erach, from *keterak*, the Arabic name).—As we have already seen, the hardy Scale fern, Ceterach officinarum, is now called Asplenium ceterach by botanists. It is suitable for the rockery.

Chalk.—Useful as an application to sour, acid soils. *See* Manure and Lime.

Chamaecyparis (White Cedar).—*See* Cupressus.

Chamaepeuce (chamaepēū-ce, from *chamai*, dwarf, and *peuke*, pine, pine-like leaves. Ord. Compositae).—Two plants are grown under this name, although modern botanists put them in the genus Cnicus. They are C. Casabonae and C. diacantha, the former of which is known as the Fish-bone or Herring-bone Thistle. They are grown for their foliage, being planted out in sub-tropical gardens. They may be raised from seed in a warm house in spring, and have ordinary garden soil.

Chamaerops (chamāē-rops, from *chamai*, dwarf, and *rhops*, a twig—literally, small palm. Ord. Palmeae).—Fan-leaved palms, gracefully cut. C. humilis is a popular plant, and is comparatively hardy, so that it may be grown in a cool house, or even out of doors in mild districts. Loam, with a little leaf mould and some sand. will suit. Propagation is by seed in a warm house, or by suckers. It may be grown in a room, and with careful watering and an occasional sponging of the leaves, will remain healthy a long time.

Charcoal.—The result of burning wood with exclusion of air, charcoal is almost pure carbon, and as such is good for mixing with composts for plants of almost all kinds. When broken into pieces about the size of cob-nuts it may be put at the bottom of flower-pots, where it will help to keep the soil sweet. A few bits in bulb glasses and bowls are good. Orchid growers make considerable use of it.

Chards.—When the principal heads of Globe Artichokes have been used, the plants are cut back, and new growths break. When these are about 2 ft. high they are bound round with straw and earthed to blanch them. In about 6 weeks the stems will be ready, and are then called Chards.

Charlock, Ketlock (Brassica Sinapistrum. Ord. Cruciferae).—This yellow-flowered weed is common in the fields and sometimes invades the garden. It may be killed by an application of bluestone (sulphate of copper) at the rate of 15 lb. per 40 gallons of water.

Cheilanthes (cheilān-thes, from *cheilos*, a lip, and *anthos*, a flower, referring to the form of the fructifying organs. Ord. Filices).—A genus of ferns, of which two or three species are popular plants. The best known is fragrans, a half-hardy perfumed species. Microphylla, myriophylla elegans and farinosa, which require a warm house, are also esteemed; the last has powdery leaves (*see* the *Botanical Magazine*, t. 4765). Equal parts of loam and peat, with sand and a little charcoal, make a suitable compost. Propagation is by spores, sown in a warm, moist house.

Cheimatobia brumata (Winter Moth).—*See* Apples.

Cheiranthus (cheirān-thus, from *cheir*, the hand, and *anthos*, a flower, alluding to the popularity of the Wallflower as a nosegay. Ord. Cruciferae).—By far the most important member of this genus is Cheiri, the common Wallflower (*see* Biennials and Wallflower). Alpinus, which grows about 9 ins. high and has yellow flowers in May; and Marshalli, 1 ft. high, orange flowers in May, are both popular plants, and may be used on the rockery. Allionii, orange, is beautiful; and mutabilis, bronzy orange, a hybrid, is also good. They like a dry limestone soil. Propagation is by seeds, or cuttings under a shaded bell-glass in summer.

Chelone (chelō-ne, from *chelone*, a tortoise, a fancied resemblance of the flower. Ord. Scrophularineae).—Allied to Pentstemon. The best-known species is barbata, now called Pentstemon barbatus, which grows about 3 ft. high and bears scarlet flowers in July. A plate of it will be found in the *Botanical Register*, t. 116. Lyoni, 4 ft., purple flowers in August, is also grown. Obliqua, 4 ft., purple, August, is sometimes seen. They may be raised from seed in spring, or propagated by division. Ordinary garden soil.

Chenopodium (chenopō-dium, from *chen*, a goose, and *pous*, a foot, in allusion to the shape of the leaves. Ord. Chenopodiaceae).—Only two members of this genus are grown to any extent, viz.: atriplicis (purpurascens), an annual growing about 5 ft. high, with purple flowers in August, used as an ornamental plant; and Bonus-Henricus, Mercury, or Good King Henry, which is grown in Lincolnshire as a substitute for Spinach. A newer plant, amaranticolor, is beginning to arrest attention. It will grow 7 ft. high the same year from a spring sowing in favourable conditions, and the young leaves may be cooked. They are bright red, and when rubbed the pigment comes off on the fingers. It does not ripen seeds in Great Britain.

Cherry.—*See* Cerasus and Fruit.

Cherry Laurel, another name for Common Laurel.

Cherry Pie, Heliotrope.

Cherry Plum, Prunus cerasifera.

Chervil.—*See* Kitchen Garden

Chestnut.—Handsome trees. *See* Aesculus and Castanea.

Chickling Vetch (Lathyrus sativus).—Often, but erroneously, called Lord Anson's Pea, which is Lathyrus magellanicus (syn. nervosus).

Chickweed (Stellaria media. Ord. Caryophyllaceae).—A common weed, easily kept under by regular hoeing.

Chicory.—*See* Kitchen Garden.

Chimonanthus, Japanese Allspice (chimonān-thus, from *cheima,* winter, and *anthos,* flower, in allusion to the season of blooming. Ord. Calycanthaceae).—There is but one species, the deliciously perfumed fragrans, which bears yellow and red flowers (*see* the *Botanical Magazine,* t. 466). There is a larger variety called grandiflorus. One flower, laid in a saucer of water, will perfume a fairly large room. It likes peaty soil, and a sheltered wall angle. Propagation is by layers in autumn, and by seeds sown in a warm house in spring.

Chinodoxa, Glory of the Snow (chinodōx-a, from *chion,* snow, and *doxa,* glory. Ord. Liliaceae).—*See* Bulbs.

Chives (Allium schoenoprasum. Ord. Liliaceae).—Used as a substitute for young Onions in spring salads. Ordinary soil. They may be grown from seed or offsets in spring.

Chlorophyll.—The green colouring of leaves. The granules must have light, hence the whiteness of plants grown in the dark. Chlorophyll is able to decompose carbonic acid.

Chlorophytum (chlorophȳ-tum, from *chloros,* green, and *phyton,* a plant. Ord. Liliaceae).—This genus is allied to Anthericum, and elatum variegatum, which is used in summer bedding for its variegated foliage, is often called Anthericum variegatum. Loamy soil suits, and propagation is by division. It is an evergreen, and should be wintered in the greenhouse.

Choisya (chōī-sya, after M. Choisy. Ord. Rutaceae).—The only species grown, ternata, is an evergreen shrub, forming a dwarf bush in a sheltered place, and bearing white flowers in early summer. The leaves are green and glossy. It likes loamy soil, and may be propagated by cuttings in sandy soil under a bell-glass either in spring or autumn. In cold districts it should be grown in pots in a cool house.

Chorozema or **Chorizema** (chorozē-ma, from *choros,* a dance, and *zena,* a drink, owing to the dance of joy which followed the discovery of water near the habitat of the plant in New Holland. Ord. Leguminosae).—Attractive greenhouse evergreens, liking peat, with a third of loam and some sand and charcoal. Propagated by cuttings in sandy soil under a bell-glass in summer. They flower in spring, and may be put out of doors for the summer. They will require a good deal of water then, but not much in winter. When they start growing they may be pruned and repotted. Angustifolium, with red and yellow flowers; cordatum, red, and its variety splendens; and Henchmanni, scarlet (*see* the *Botanical Magazine,* t. 3607), are the principal kinds. Flavum and superbum are the same as cordatum.

Christmas Rose (Helleborus niger).—*See* Bulbs.

Chrysalid, Chrysalis.—The stage of insect life before the perfect winged butterfly or moth. The study of chrysalids is interesting, as they mimic various things on which they are laid to escape the eyes of birds. Those of recognised garden pests should be destroyed when found.

Chrysalidocarpus lutescens.—The same as Areca lutescens, a handsome warm-house palm, which thrives in a sandy compost of loam and leaf mould. *See* Palms.

Chrysanthemum (chrysān-themum, from *chrysos*, gold, and *anthos*, flower. Ord. Compositae).—Thousands of people who visit Chrysanthemum shows in autumn are impelled to grow this beautiful flower. It gives us a great range of colours and large, handsome flowers at a period of the year when bloom is getting very scarce. Moreover, it is a good town plant. Some of the most beautiful collections are grown in densely populated districts in East London, in one case—Southwark Park—close to the Thames, where the atmosphere is never of the purest, and where fogs are not uncommon. Large flowers prevail in the prize competitions, and very remarkable they are, as exhibited by the best growers. Blooms of the Japanese section 10 ins. deep and wide are not rare. Of perfect form, beautifully finished, with broad, evenly folded florets, and bright, fresh colours, they are indeed noble examples of floricultural skill. At the same time, the charming single and small double (generally spoken of as " decorative ") varieties have a wide circle of admirers, and we must remember that these play an important part in small houses, and in providing abundance of flowers for cutting. It is mainly from the ranks of the decorative varieties that we draw Chrysanthemums for outdoor culture, and every year the Autumn Queen extends her sway in outside beds and borders.

History.—The history of the Chrysanthemum may be briefly summarised as follows: The species indicum and sinense were natives of China, and the latter was introduced to Great Britain in 1764. From them certain varieties were raised. The first double variety was grown at Kew towards the end of the eighteenth century, and within the next 25 years several others appeared. The first show is said to have been held at Norwich in 1829; the first in London was held at Stoke Newington in 1847. The raising of new varieties became active about 1830; the first Incurved appeared about 1836, and the first Japanese in 1860 or 1861. The Pompon Chrysanthemum was raised from a species introduced in 1846.

Classification.—With the introduction of many different types, and the rise in popularity of the flower, a system of classification became desirable, and by slow stages the following system was arrived at: The flowers were classified in 10 groups, namely, Japanese (large flowers with long flat or quilled florets); Incurved (smaller flowers, cup-shaped, with quilled florets that curve in towards the centre); Japanese Incurved (larger than ordinary Incurved, with long, broad florets); Reflexed (small, circular flowers with reflexed florets); Japanese Reflexed (like a small Japanese, florets broad and reflexed); Large Anemone-flowered (flat ring of

florets round a raised disc of quilled ones); Japanese Anemone-flowered (outer ring of flat drooping florets round a raised disc of quilled ones); Pompon (small, roundish double flowers not more than 2 ins. across); Pompon Anemone (small form of the large Anemone-flowered); Single (round, flat flowers, with only 2 or 3 rows of florets, centre open). As we may reckon in with the Japanese the great majority of the small-flowered double "decorative" varieties grown for greenhouse and garden decoration (although a few of these are Pompons), it is much the most important class. Next to the Japanese for show only comes the Incurved, but for general purposes the Single holds second place. The rank and file of Chrysanthemum growers could well afford to ignore all the classes except the Japanese and single.

Growing for large show blooms.—This is a distinct and specialised form of culture, which should not be embarked on except by those who can give attention to the plants for the better part of a year, make a study of bud production, provide special soil and pots, and grow large varieties. The routine is briefly as follows: (1) Strike cuttings (preferably short, sturdy suckers from the base) in November or December, in 3-in. pots filled with loam well lightened with leaf mould and sand; keep close till rooted, then in a light, cool, airy house till March, when they may be shifted to 5-in. pots and stood on a bed of cinders in a cold frame, a mat being put over on frosty nights; strike a few more cuttings from tops in spring. (2) Stop such plants as require it in spring, so as to get 3 shoots for giving crown buds in August. The varieties vary a great deal in respect to spring stopping, as the following examples of certain popular Japanese sorts will show:—

Variety.	When to Stop.	Crown Bud.
Algernon Davis	end of March	2nd
Bessie Godfrey	end of May	1st
Brilliant	natural break	1st
Dorothy Gouldsmith	3rd week in May	1st
Duchess of Sutherland	end of April	1st
Edith Jameson	end of April	1st
E. J. Brooks	early in April	2nd
Emily Towers	3rd week in May	1st
Florence Penfold	natural break	1st
F. S. Vallis	end of May	1st
F. W. Lever	1st week in May	1st
George Mileham	natural break	1st
Harry Wood	natural break	1st
Henry Perkins	early in April	2nd
Henry Stowe	1st week in April	1st
H. J. Jones	natural break	1st
Hon. Mrs. Lopes	1st week in March	1st
H. W. Meadows	natural break	1st
J. H. Silsbury	middle of April	2nd
J. Lock	1st week in April	1st
John Peed	natural break	1st
J. W. Molyneux	natural break	1st

CHRYSANTHEMUMS—*continued.*

VARIETY.	WHEN TO STOP.	CROWN BUD.
Joseph Stoney	middle of April	2nd
Lady Conyers	3rd week in March	2nd
Lady Frances Rider	3rd week in March	2nd
Lady Hopetoun	end of March	2nd
Lady Talbot	1st week in March	1st
Leigh Park Rival	early April	2nd
Leigh Park Wonder	3rd week in March	2nd
Madame C. Terrier	end of April	1st
Madame G. Rivol	middle of April	1st
Madame Paolo Radaelli	middle of April	1st
Madame R. Cadbury	middle of April	1st
Magnificent	3rd week in March	2nd
Marquise V. Venosta	middle of April	2nd
Master David	middle of April	1st
Master James	natural break	1st
Melchett Beauty	natural break	2nd
Miss Elsie Fulton	1st week in June	1st
Miss Mildred Ware	end of March	2nd
Miss Olive Miller	natural break	1st
Mrs. A. H. Lee	natural break	1st
Mrs. A. T. Miller	natural break	1st
Mrs. Barkley	natural break	2nd
Mrs. Beckett	1st week in April	2nd
Mrs. Eric Crossley	end of March	2nd
Mrs. F. W. Vallis	1st week in April	2nd
Mrs. F. C. Stoop	1st week in April	1st
Mrs. George Mileham	end of May	1st
Mrs. G. F. Coster	end of March	2nd
Mrs. Greenfield	early June	2nd
Mrs. H. Weeks	1st week in March	1st
Mrs. L. Thorn	natural break	1st
Mrs. N. Davis	3rd week in March	2nd
Mrs. Percy S. Cleave	natural break	1st
Mrs. R. H. B. Marsham	1st week in April	1st
Mrs. R. H. Pearson	middle of April	2nd
Mrs. Trevor Williams	mid-April	1st
Mrs. Walter Jinks	early in April	1st
Mrs. W. Knox	end of April	2nd
N. C. S. Jubilee	3rd week in March	2nd
Norman Davis	3rd week in March	2nd
O. H. Broomhead	natural break	1st
Pockett's Surprise	early in April	2nd
President Viger	early in March	2nd
Reginald Vallis	3rd week in March	2nd
Revd. R. D. Eves	middle of April	1st
Rose Pockett	3rd week in March	2nd
Sidney Penford	natural break	1st
Sir Albert Rollit	1st week in April	1st
Splendour	end of March	2nd
Valerie Greenham	natural break	1st

Variety.	When to Stop.	Crown Bud.
Walter Jinks	3rd week in April	1st
W. Beadle	end of March	2nd
Incurved—		
A. H. Hall	natural break	1st
Baron Hirsch	natural break	1st
Buttercup	3rd week in May	1st
Charles H. Curtis	3rd week in May	1st
Emblème Poitevine	3rd week in May	1st
Ialene	3rd week in May	1st
Lady Isabel	3rd week in May	1st
Madame Edmond Roger	3rd week in March	2nd
Madame Ferlat	middle of March	2nd
Mrs. Barnard Hankey	3rd week in March	2nd
Mrs. F. Ashworth	end of April	1st
Mrs. G. Denyer	3rd week in April	2nd
Mrs. Robert H. Hall	3rd week in March	2nd
Souvenir de W. Clibran	1st week in April	2nd
Topaze Orientale	natural break	1st
W. Biddle	natural break	1st
W. Pascoe	early in May	1st

" Stopping " is nipping off the top of the plant. The result is that the plants break into three shoots. Any side shoots which form on these throughout the summer should be picked out at once. Flower buds with leaf shoots round them will form in summer. These are called crown buds. In the column for crown buds it will be seen that some are marked 1st and some 2nd. With those marked 1st the first crown buds which form should be kept, and the leaf shoots round them picked out; with those marked 2nd the first crown buds, with all but one of the leaf shoots round them, should be removed; the shoots left will then grow on and form a second crown bud, with leaf shoots as before; in this case the bud should be kept and the leaf shoots rubbed out. This procedure, varied as to time of first stopping according to the peculiarity of each variety, must be adopted with all prize Chrysanthemums. Without it, it would be impossible to get all the varieties at their best together. The peculiarities of every variety grown must be learned by consultation with experts. Speaking generally, prize flowers require from 12 to 13 weeks to arrive at perfection from the time of bud formation. (3) Transfer the plants to 8-in. or 9-in. pots about the middle of June, using some such compost as the following, and ramming it in well: 4 parts fibrous loam, 1 part decayed manure, 1 part leaf mould and enough sand to make it gritty. A quart of bone meal may be well mixed in each bushel of soil. The pots should be drained by laying some overlapping crocks in the bottom and covering with rough flakes of soil. Stand the pots on a bed of cinders in the open air. (4) Support the shoots as they grow throughout the summer, and water regularly—several times a day if necessary. If the soil gets so dry as to shrink from the side of the pot, success will be jeopardised very seriously. Give liquid manure when the buds show colour. (5) Put the plants under

CHRYSANTHEMUMS—*continued.*

glass by the end of September, give plenty of air, and use the syringe. If there is any trace of mildew, dissolve an ounce of fresh liver of sulphur in 3 gallons of water and syringe the plants with it. This may be done even when they are in bloom. The same remedy may be used for rust.

Growing for bushes.—Much less trouble is involved when it is only a case of growing plants as bushes to yield a larger number of smaller flowers. To begin with, a later start may be made, as it is not necessary to strike the cuttings till spring. The tortuous question of bud selection may be dropped entirely. It is true that stopping may be advisable, but it is merely to get a shapely plant. Thus if the tips are pinched off when the young plants are about 6 ins. high it will encourage them to throw out side shoots. Any plants which tend to straggle may be stopped again. Flower buds will appear in clusters late in summer, and may be thinned or not at discretion. If thinning is done the buds left form larger flowers than without thinning, but of course there are fewer of them.

Culture in the garden.—The Chrysanthemum is a very beautiful autumn flower for the garden, and every garden lover will take care to have a collection of plants, some for lifting when they come into bud and replanting to fill bare places, some for groups in beds or borders, some, perhaps, in a reserve bed merely to yield flowers for cutting. If plants are shifted from one place to another in late summer, the precaution should be taken of giving the soil round them a good soaking just before, and they should also be watered in. But perhaps a spell of showery weather will come at a suitable time to favour the operation. Plants set 3 ft. apart in clumps of 3 or more make beautiful colour groups. The way to make a start is to buy young plants freshly rooted from cuttings in spring. Plant them in deep, manured soil, and give an occasional soaking of water and liquid manure in dry weather. Give each plant a strong stake when necessary, and tie securely, as the growths are rather brittle and liable to be broken in windy weather. No stopping is required. When the plants go out of bloom lift them, cut them back to stumps, pack them with their labels in boxes with moist soil round them, and put them in a sheltered place where some litter can be thrown over them in hard weather, or in a frame. When shoots push up from the roots 3 or 4 ins. long take them off, strike them, and so get a fresh stock of good plants for the coming year. In sandy, friable, well-drained soils the roots may be left in the ground all the winter, and they will throw up fresh shoots in spring like an herbaceous plant.

Varieties.—It is somewhat dangerous to recommend varieties of a plant which, like the Chrysanthemum, is still being developed actively by the florists, as the sorts are quickly out of date. Certainly those who want to specialise the flower for exhibition or other purposes should keep themselves in touch with the principal societies and raisers. But there are certain varieties of established merit which are not likely to be superseded quickly. The Japanese and Incurved varieties named in the foregoing table are reliable. The following are good in the other classes:—

Reflexed.

Dr. Sharp
King of Crimsons

Large Anemone-flowered.

Descartes
Gluck
Lady Margaret

Pompon-Anemone.

Calliope
Gem of Earlswood

Pompon.

Mdlle. Elise Dordan
Wm. Westlake

Single.

Altrincham Yellow
Caledonia
Florrie King
Gaiety
Gem of Merstham
Ideal
Ladysmith
Mrs. Tresham Gilbey
Pyrethrum
Sandown Radiance

Double Garden Varieties.

Aquitaine
Bijou Rose
Champ d'Or
Evelyn
*Firefly
Gascoigne
*Guinea Gold
Horace Martin
*Le Pactole
Minnie Carpenter
Nina Blick
Roi des Blancs
*Ryecroft Glory
*September Belle
Victor Mew
*White Quintus

Double Varieties for Pot Bushes.

Altman's Yellow
Framfield Pink
Kathleen Thompson
L. Canning
Market Gold
Money Maker
Source d'Or
W. H. Lincoln
Winter Cheer

*These would make a good six.

The list includes both early and late bloomers.

Species of hardy summer Chrysanthemums.—The value of the genus is far from being exhausted by the beautiful varieties of the florists' Chrysanthemum which blooms in autumn. There are several good hardy species which flower in the garden in summer, notably the Ox-eye Daisy, C. Leucanthemum; the Pyrenean or Moon Daisy, C. Maximum; and C. (otherwise Pyrethrum) uliginosum. The two first grow about a yard high and make good bushes. They are extremely useful plants, as they thrive in almost any soil, and bear their large white flowers on long stems. The following are a few good varieties of the Moon Daisy; all have white flowers:—

G. H. Sage, fringed
King Edward VII.
Princess Henry
Triumph

C. uliginosum is a taller, less bushy plant, and blooms later. All of the foregoing are hardy herbaceous perennials, may be propagated by division in spring, and are good for herbaceous borders. For annual Chrysanthemums, *see* Flower Garden—Annuals. Of the other Chrysanthemums the most important are frutescens, the well-known Marguerite; and Parthenium, the Golden Feather. The Marguerite is a valuable pot plant for cool greenhouses and con-

servatories, and is also useful for window-boxes. It grows freely, forms nice bushes, blooms abundantly, and is easily grown. Cuttings of young shoots, or from the base, strike readily in spring, summer, or autumn in sandy soil. Good plants can be grown in 6-in. pots. If grey lines show in the leaves, indicating the presence of a grub, they should be pinched between thumb and finger. The yellow Marguerite, Etoile d'Or, is now almost as popular as the white, and both may be grown successfully under similar treatment. The Blue Marguerite belongs to a different genus. It is Agathaea coelestis. It may, however, be grown in the same way as the true Marguerites. The Golden Feather is used for lines and designs in formal beds. It may be treated like an annual, being sown in a box in frame, put in a heated frame or greenhouse, pricked off, hardened in an unheated frame, and planted out in summer. The soil must not be made rich, or the plants will grow rank and green. They should be pinched regularly with finger and thumb to keep them dwarf.

Chrysocoma, Goldilocks (chrysocō-ma, from *chrysos*, gold, and *kome*, hair, alluding to the yellow florets. Ord. Compositae).—The best-known species is Lynosyris, a hardy herbaceous plant now called Aster Linosyris by botanists. It may be grown in the border. C. Coma-aurea is a greenhouse evergreen, growing about 2 ft. high and producing yellow flowers in July (*see* the *Botanical Magazine*, t. 1972). Peat and loam in equal parts, with sand, suit. Propagation is by cuttings under a bell-glass in spring.

Chrysogonum (chrysō-onum, from *chrysos*, yellow, and *gonu*, a joint. Ord. Compositae).—Virginianum is a good yellow spring-flowering hardy herbaceous perennial, 1 ft. high. Loamy soil. Propagated by division in early summer.

Cibotium.—*See* Dicksonia.

Cichorium (Chicory).—*See* Kitchen Garden.

Cimicifuga, Bugwort (cimicīf-uga, from *cimex*, bug, and *fugo*, to drive away. Ord. Ranunculaceae).—Very handsome hardy herbaceous plants, well worth growing in the border. They do best in a heavy, moist soil. In light, dry soil they ought to have a shady place. Propagation is by division in spring. The following are good: cordifolia, 3 ft. high, July, white flowers (see *Botanical Magazine*, t. 2069); foetida (syns. frigida, simplex), 3 ft., white; and racemosa, 4 to 5 ft., August, white.

Cinchona (cinchō-na, after the Countess of Cinchon. Ord. Rubiaceae).—Of no garden value, but of medicinal interest as yielding quinine, which is prepared from the bark and is famous as a febrifuge.

Cineraria (cinerār-ia, from *cineres*, ashes, in allusion to the grey leaves. Ord. Compositae).—The Cineraria of the florists, whether represented by the round-flowered, smooth-edged strains that were the joy of an older generation, or the " star-flower " type (stellata) which enjoys so much favour to-day, is a free-blooming, brilliant, and easily-grown plant, well worthy of the high esteem in which it is held. Easily raised from seed, almost hardy, blooming in winter

and spring, it is a most valuable plant. Good strains of seed are rather dear, but they are worth their cost. They may be sown in May and June similarly to Calceolarias, pricked off into boxes, then put singly in small pots, and finally transferred to 6-in., 7-in., and 8-in. pots, in which they will flower. They must have cool, airy conditions in summer, and a frame suits them. They may even be stood in the open air. Green fly (*see* Aphides) must be kept away. Cineraria maritima, a dwarf plant with silvery foliage, is often used in bedding. It may be raised from seed in spring. Such other species as are grown are now called Senecios by botanists, but only one is much used in gardens, and that is cruenta, a greenhouse perennial growing about 2 ft. high and with purplish flowers in summer (*see* the *Botanical Magazine*, t. 406).



A Seedling Cineraria ready for pricking off.

Cinnamomum, Cinnamon (cinnamō-mum, from *kinamon* (Arabic). Ord. Laurineae).—Unimportant horticulturally, but important economically, as C. zeylanicum yields cinnamon and C. Camphora gives camphor.

Cinquefoil.—*See* Potentilla.

Cissus (cĭss-us, from *kissos*, Ivy, in allusion to the habit. Ord. Amepelideae).—One species, discolor, is grown. It produces greenish flowers in September, but is chiefly grown for its handsome leaves, which are velvety green marked with white (*see* the *Botanical Magazine*, t. 4763). It may be grown in peat and loam in equal parts, with sand, on the roof of a hothouse. Propagation is by cuttings of side shoots under a bell-glass in heat.

Cistus, Rock Rose (cĭs-tus, from *kiste*, a box, alluding to the shape of the seed vessel. Ord. Cistineae).—Brilliant shrubs, suitable for the rock garden, flowering in June, and thriving in warm, sunny, sheltered places. They like well-drained, sandy soil. Propagation is by seeds in spring, in a frame or greenhouse, or by cuttings in May and layers in late summer. The following are the best: albidus incanus, white; crispus, purple; cyprius, white; and salvifolius, white, all 2 ft. high; and ladaniferus, white, and its varieties, such as maculatus, spotted; laurifolius, white; lusitanicus, white or yellow; and longifolius, white; all of which grow 4 ft. high.

Citrus (cīt-rus, from Citron, a town in Judea. Ord. Rutaceae).—A genus of little value from the garden point of view, but very important economically, giving, as it does, the Orange (C. Aurantium), the Shaddock (C. decumana), the Citron (C. medica), the Lime (C. medica Limetta), and the Lemon (C. medica Limonum). The Otaheite Orange is sometimes grown as a pot plant (*see* Fruit, p. 154); nice dwarf plants can be grown in 6-in. pots, and low standards in 8-in.

Clarkia (clārk-ia, after Captain Clark. Ord. Onagrarieae).—*See* Annuals.

Clary (Salvia sclarea).—An old English plant, getting its name of Clary (clear-eye) from its supposed value in eye affections. It is sown in spring for use as a pot-herb.

Clay.—*See* Soil, Kitchen Garden, and Drainage.

Clematis (clēm-atis or clemāt-is, from *klema*, a vine-shoot, alluding to the habit. Ord. Ranunculaceae).—One of our most valuable rambling plants, thriving in most soils, and giving a profusion of beautiful flowers. The lovely white montana, which blooms in early summer, may be propagated by cuttings after flowering. Jackmanii, and most of the garden varieties and hybrids, are propagated in the nurseries by grafting on the species Vitalba (*see* Grafting); but they may sometimes be struck from cuttings of mature side shoots under a bell-glass in summer, or from layers in September. The Clematises are not fastidious about soil; they prefer light to heavy land if it is manured; damp, stiff soil is not suitable. They should not be planted where the roots will be subject to constant drip in wet weather. It is wise to plant the Jackmanii set early, and cut them back to within a foot of the ground at once; they are then sure to break strongly; when planted late, and unpruned, they often fail. The pruning of the different kinds varies, and it may be well to classify them: *Coccinea group:* these are hybrids from coccinea (syn. Pitcheri), a scarlet, urn-shaped species flowering in July; the following are good: Countess of Onslow, deep red; Duchess of Albany, pink; and Sir Trevor Lawrence, crimson; thin as required. *Florida group:* these are suitable for cool greenhouses; Battle of Woking, double, grey; and Duchess of Edinburgh, double, white, are popular sorts; thin out crowded shoots in late winter and leave the rest. *Jackmanii type:* Jackmanii, violet; J. alba Smith's variety, white; Madame Edouard André, red; and Prince of Wales, puce, are four of the best of this set, and they should be pruned hard annually, the flowered shoots of one year being cut back to the old wood, making way for strong new shoots, which will bloom well the same year. *Lanuginosa group:* these are large and beautiful flowers, suitable for pillars; Beauty of Worcester, violet; Enchantress, double, white; and Venus Victrix, double, lavender, are three of the best; they do well with the same pruning as the Florida group. *Patens group:* beautiful for arches and pillars; Fair Rosamond, blush; Lady Londesborough, silver; Miss Bateman, white; and The Queen, lavender, are good; they should have the same pruning as the Florida set. *Viticella group:* Lady Bovill, silvery blue; Viticella alba, white; and V. rubra grandiflora, red, are three of the best, and may have Jackmanii pruning. Of the old species, Flammula, hardy, white, sweet; indivisa and its variety lobata, white, greenhouse; and Vitalba, hardy, white, the Traveller's Joy or Old Man's Beard, may be mentioned. The last is beautiful in the hedgerows in autumn, but montana is a much better garden plant; the newer variety of it, rubra, is desirable.

Clerodendron (clerodēn-dron, from *kleros*, chance, and *dendron*, a tree, in allusion to uncertain medicinal qualities. Ord. Verbena-

ceae).—Although this is a fairly large genus, only one or two species are grown to any extent. Much the most popular is Balfouri, a variety of Thomsonae, which produces its brilliant light scarlet flowers at the end of summer. It is a beautiful plant, but not easy to do well. It likes the temperature of a hothouse, and a compost of fibrous loam with a fourth of leaf mould and some sand. If stock is required, a few of the young side shoots may be taken off in spring and struck in sandy peat under a bell-glass. Water liberally in summer, but sparingly in winter. Balfouri is of vigorous habit and may be used as a climber. Fallax is dwarfer and also has scarlet flowers. This and splendens are evergreens, whereas Balfouri loses its leaves in winter.

Clethra (clēth-ra, from *klethra*, adder (Greek), in reference to the resemblance of the leaves. Ord. Ericaceae).—Only two species are grown to any extent: alnifolia, white, 4 ft. high, hardy, blooming in late summer; and arborea, white, flowering in September, and requiring a greenhouse. The latter is illustrated in the *Botanical Magazine*, t. 1057. It is a shrub growing 6 to 8 ft. high; there is a dwarf variety called minor and one with variegated leaves called variegata. Peat, with a third of loam, and sand, suit the Clethras. Arborea is best propagated by cuttings in spring under a bell-glass; alnifolia by cuttings in summer or layers in autumn.

Clianthus, Glory Pea (cliān-thus, from *kleios*, glory, and *anthos*, flower. Ord. Leguminosae).—Brilliant flowers. The best-known species are Dampieri, the Parrot-beak flower, scarlet with black boss, which does well in a hanging basket in a cool house; and puniceus, crimson, which will thrive outdoors in sheltered places, but is best in a cool greenhouse in cold districts. They are evergreen shrubs, which may be raised from seed in spring, and further propagated by cuttings in sandy soil under a bell-glass. They like peat and loam in equal parts, with sand.

Click-beetle.—*See* Wireworm.

Climbers and Creepers.—People use the word "climber" in a somewhat loose way in connection with plants, applying it equally to a Gloire de Dijon Rose which spreads over a considerable area of wall by mere vigour, and to Veitch's Virginian Creeper, which throws out adhesive suckers and actually climbs as certainly as an Indian climbs with his slings. Accepting the broad definition, we have a large selection of climbers, and there is no reason why walls, fences, palings, arches, pillars, pergolas, and summer-houses should go bare. For high walls there is nothing better than the Virginian Creeper and selected Ivies (*see* Hedera); but a vigorous Rose, such as William Allen Richardson, will cover a considerable area of wall if planted in good soil. This Rose may be thought of for an east wall, an aspect on which it will thrive better than most plants. Ivy also does on east and north walls. Roses (*see* Flower Garden) and Ceanothuses (*see* Ceanothus) may be considered for south and west walls, with Pyrus (Cydonia) Japonica for low positions under windows. The latter plant produces large, brilliant flowers, followed by edible fruit. A good Honeysuckle is Lonicera flexuosa, for it is a strong grower, free flowering and sweet. Clematises (*see* Clematis)

must not be overlooked, for they comprise two particularly valuable plants in montana and Jackmanii, and several others of much importance. There is no more beautiful creeper than the Flame Nasturtium, the Tropaeolum speciosum of botanists; but it will not thrive in dry, hot positions. It must have root and atmospheric moisture to give its true beauty. Climbers and creepers sometimes fail because they are planted in a position where they catch drip from a roof. This should be avoided, if necessary by planting rather farther from the wall, and then training in. An annual mulching of manure helps the plants. In most cases pruning takes the form of thinning out the older growth to make room for younger wood. In a few cases, notably the Wistaria, the young wood is spurred to older branches. Climbers must also be selected for arches, pillars, pergolas, and summer-houses (*see* Flower Garden). The following selections may be useful:—

Hardy Perennial Climbers.
- Ampelopsis
- Aristolochia
- Calystegia
- Clematis
- Eccremocarpus
- Hedera (Ivy)
- Jasmine
- Lonicera (Honeysuckle)
- Periploca
- Polygonum
- Rose
- Tropaeolum
- Vitis
- Wistaria

Tender Perennial Climbers.
- Allamanda
- Aristolochia
- Asparagus
- Bignonia
- Bougainvillea
- Cestrum
- Clematis
- Clerodendron
- Cobaea
- Ficus
- Gloriosa
- Hoya
- Ipomaea
- Lapageria
- Maurandya
- Passiflora
- Smilax
- Tacsonia
- Thunbergia
- Vitis

Hardy Annual Climbers.
- Convolvulus
- Polygonum
- Tropaeolum

Tender Annual Climbers.
- Ipomaea
- Mina
- Thunbergia

All of the plants are dealt with under their own names.

Clivia, Imantophyllum (clī-vea, after a member of the Clive family. Ord. Amaryllideae).—*See* Bulbs.

Cobaea (cō-baea, after Señor Cobo. Ord. Polemoniaceae).—Only one member of this genus is grown to any extent, and that is scandens, a rambler bearing purple flowers in summer (*see* the *Botanical Magazine*, t. 851). There is a variety with white-margined leaves. It is suitable for the roof of a cool house, or for pillars outside in summer, and the best plan is to treat it as an annual, sowing in heat in spring, hardening in a frame, and planting out in June. Ordinary soil.

Cockchafer (Melolontha vulgaris).—In its grub stage the May bug feeds on the roots of trees and as a beetle on the leaves. The most harm is done as grubs, more particularly because, working under ground, they are not seen. If trees suffer from no apparent cause it is well to fork up the soil and leave the starlings to find the pests.

Cockscomb.—*See* Celosia.

Cockspur Thorn, Crataegus crista-galli.

Cocoa-nut Fibre Refuse.—This is the best material for plunging (*see* Bulbs), and it may be used repeatedly for the purpose. In a moist state it is good for freshening up imported Lilium bulbs before potting them. It is also useful for mulching beds in summer, checking the escape of moisture.

Cocos (cō-cos, from *coco* (Portuguese), a monkey, in reference to the shape. Ord. Palmae).—The Cocoa-nut Palm, C. nucifera, has no particular value horticulturally; but the species Weddeliana is one of the most graceful of small palms for greenhouse and room decoration. *See* Palms.

Codiaeum, Croton (codiāē-um, from *codebo*, the Malayan name. Ord. Euphorbiaceae).—*See* Croton.

Codlin Moth.—*See* Fruit—Apples.

Coelogyne (coelōg-yne, from *koilos*, hollow, and *gyne*, female, alluding to the pistil. Ord. Orchidaceae).—A charming genus of Orchids, the most popular members of which are cristata and its varieties. The flowers of the species are white crested with yellow; those of alba, white; those of lemoniana, white with lemon lip. They are easily grown, as they will thrive in a cool house with Cypripedium insigne, Odontoglossum crispum, and other kinds. They are best grown in baskets with fibrous peat, Sphagnum moss, and crocks. They will appreciate abundance of water both at the root and overhead while in full growth; the supply should be reduced when growth is mature, but they should never be dried off. If repotting is necessary it should be done when new growth starts towards the end of winter. Dayana, a beautiful species with long drooping spikes of yellow and brown flowers, should have a warmer house, as should pandurata, with green and black flowers.

Coix (Job's Tears).—A small genus of grasses (Ord. Gramineae) of which the species Lachryma-Jobi is grown, being treated as a tender annual, and raised from seed in heat in spring, hardened in a frame, and planted out. The seeds are ornamental. *See* the *Botanical Magazine*, t. 2479.

Colchicum, Meadow Saffron (cōl-chicum, from Colchis in Asia Minor. Ord. Liliaceae).—*See* Bulbs.

Coleus (cō-leus, from *koleos*, a sheath, alluding to the combination of the stamens. Ord. Labiateae).—These evergreen shrubs are valued for their coloured leaves; the flowers are inconspicuous in most cases. One species, however, thyrsoideus, has sufficiently attractive flowers to be grown for its inflorescence alone; the leaves are green and of little ornament. The flowers are pale blue, and

are borne on long stems in winter. The species is useful for growing in a collection of plants in a warm greenhouse or conservatory. The ordinary Coleuses are remarkable for the rich and varied colours of their leaves, in which crimson and green, purple, yellow, and white may be seen. Some have one-coloured leaves, others are flaked, others marbled, others margined. Plants may be grown into a nice size the same season if seed is sown in heat in early spring, and with a little pinching they will be compact, shapely bushes. Special varieties may be increased by cuttings. The weakest seedlings,



Stopping Coleuses.
1. Shoots breaking after the pinching.



Propagating Coleuses by Cuttings.
1. Drainage.
2. Rough soil.
3. Fine soil.
4. Sand.

showing the most colour, are generally the best. Six-inch pots will be large enough to flower them in, unless very large plants are wanted, as they develop the richest colour when pot-bound. Very few species are now grown. The following are good garden varieties: Beckwith's Gem, Countess of Dudley, Decorator, Pineapple Beauty, Pride of the Market, and Sunset.

Colewort.—*See* Kitchen Garden.

Collinsia (collĭns-ia, after Mr. Collins. Ord. Scrophularineae).—*See* Annuals. Coloured plates of the species will be found as follows: bartsiaefolia in the *Botanical Magazine*, t. 3488; grandiflora in the *Botanical Register*, t. 1107; verna in the *Botanical Magazine*, t. 4927. But bicolor is the most important.

Collomia (collō-mia, from *kolla*, glue, in allusion to the mucus on the seed. Ord. Polemoniaceae).—Pretty hardy annuals (*see* Annuals for culture), of which the most useful are coccinea, red; and grandiflora, red and yellow. Both grow about 2 ft. high and flower in early summer.

Coltsfoot, Tussilago.

Columbine.—*See* Aquilegia.

Colutea, Bladder Senna (colū-tea, from *koloutea*, a name given by Theophrastus. Ord. Leguminosae).—The most important species is arborescens, a shrub growing some 10 ft. high, and producing yellow flowers in summer, followed by inflated seed pods. It may be raised from seed in spring and increased by cuttings in September. No special soil is needed.

Conifers (Coniferae).—Trees and shrubs which bear cones, or woody bracts containing the flowers, such as Cedars, Firs, Larches, and Pines. The different kinds are described under their own names in this work.

Conservatory.—This structure is a display house, intended to show at their best, and in a tasteful manner, the plants grown in other houses. It is a somewhat expensive house, as it is more ornate than a greenhouse, and it must be well built, or drip will prove a nuisance. It should be near the dwelling, and may be attached to it, so that it can be entered from the drawing-room or other apartment. In large conservatories beds are made for Acacias, Camellias, Palms, and other large plants, while such plants as Passion Flowers, Tacsonias, and Lapagerias are planted to cover the roof. If there are fairly wide paths, tubs containing Clivias, Myrtles, and other favourite plants may be stood here and there. *See also* Greenhouse.

Convallaria (Lily of the Valley).—*See* Bulbs.

Convolvulus (convŏl-vulus, from *convolvo*, to entwine. Ord. Convolvulaceae).—These beautiful twiners are related to Calystegias and Ipomaeas. There are many species, and they differ a good deal, some being hardy and some tender annuals, others greenhouse or stove evergreens, and others again deciduous perennials. It is unnecessary to enumerate a quarter of the species, as they are of purely botanical interest. Althaeoides, a hardy perennial with pink flowers in June, is good; it is illustrated in the *Botanical Magazine*, t. 359. Cneorum is an attractive dwarf species with pink flowers in May, and silvery leaves (*see* the *Bot. Mag.*, t. 459); it should be grown in the greenhouse, or in a sheltered place. Major (Ipomaea purpurea) is the popular " climbing Convolvulus " of the seedsmen and of cottage gardens. Mauritanicus is a lovely little trailing shrub, well suited to basket culture in a greenhouse, or to the garden in summer; it may be raised from seed in heat in spring; the flowers are rich blue and come in summer. Tricolor is the dwarf annual Convolvulus of the seedsmen.

Coprosma (coprŏs-ma, from *kopros*, faeces, and *osme*, small, in allusion to the odour. Ord. Rubiaceae).—Only one species, Baueri, is grown to any extent, and that is more often than not represented by its varieties picturata and variegata, which have handsome leaves. They are greenhouse shrubs, thriving in loam with a third of peat and some sand. Propagation is by cuttings in heat under a bell-glass in spring.

Coptis, Gold Thread (cŏp-tis, from *kopto*, to cut, alluding to the leaf division. Ord. Ranunculaceae).—A small genus, the best-known member of which is trifolia (Helleborus trifoliatus), which grows about 6 ins. high, and produces white flowers in April. It likes a moist, peaty soil and a sheltered place. A herbaceous perennial, it may be propagated by division after flowering.

Corbularia.—*See* Bulbs—Daffodils.

Corchorus Japonicus.—*See* Kerria Japonica.

Cordyline, Club Palm (cordylī-ne, from *kordyle*, a club. Ord. Liliaceae).—These plants, which are related to Dracaenas, are grown for their foliage, which is slender and graceful. Australis and indivisa are the two most popular species; there are variegated forms of both. They are sometimes planted out of doors, but they are not hardy. Loam, with a fourth of leaf mould, and sand, suit them. They are propagated by suckers. Tall, leggy plants may be decapitated, the tops struck in bottom heat, and the stems laid in moist soil or cocoa-nut fibre refuse in heat to induce shoots to break for cuttings. *See* Dracaena.

Coreopsis, Calliopsis (coreōp-sis, from *koris*, a bug, and *opsis*, like, in allusion to the seed. Ord. Compositae).—Useful plants, the annual species of which are generally grown under the name of Calliopsis (*see* Annuals). Lanceolata is a good hardy perennial, growing about 2 ft. high and bearing yellow flowers in summer (*see* the *Botanical Magazine*, t. 2451). Grandiflora (syn. longipes) is also a good perennial with yellow flowers in summer. Drummondii and tinctoria are the best of the annuals; both have red and yellow flowers. Grantii, yellow, blooms in the greenhouse in winter.

Coris monspeliensis.—A pretty rockery plant (Ord. Primulaceae), which grows about a foot high, and produces lilac flowers in June (*see* the *Botanical Magazine*, t. 2131). It likes a dry, sunny spot, with sandy peat. It is easily raised from seed sown under glass in spring.

Corn Flag.—*See* Gladiolus, under Bulbs.

Cornflower.—*See* Centaurea and Annuals.

Cornish Moneywort, Sibthorpia europaea.

Corn Salad.—*See* Kitchen Garden.

Cornus, Dogwood (cōr-nus, from *cornu*, a horn, alluding to the hardness. Ord. Cornaceae).—Deciduous shrubs, much esteemed for the beauty of their foliage and the brightness of the bark. Alba, a Siberian species, has white flowers in July. Späthi and variegata are popular varieties of it. Capitata has white flowers in August; it is not quite hardy; fruit sometimes ripens on a wall in Great Britain, but it is not edible; this is the Benthamia fragifera of the *Botanical Magazine*, t. 4641. Florida has white flowers in spring; it is one of the best, and there are good varieties in rubra and pendula. Mas (syn. mascula), the Cornel or Cornelian Cherry, has yellow flowers in February (*see* the *Botanical Magazine*, t. 2675). There are several varieties of it, aurea elegantissima being one of the best. Sanguinea is the common British Dogwood; the berries are black; it is often planted for winter effect, the red branches being bright. There are one or two herbaceous perennials, the best being canadensis (see *Botanical Magazine*, t. 880), with yellowish flowers in summer, suitable for the rock garden where peat can be given. The shrubby Dogwoods need no special soil, but they do not like a dry spot. Propagation is by seeds, layers, cuttings, and division.

Coronilla, Crown Vetch (coronĭll-a, from *corona*, a crown, alluding to the arrangement of the flowers. Ord. Leguminosae).—The most popular member of this genus is glauca, a greenhouse evergreen shrub, bearing yellow flowers in late spring (*see* the *Botanical Magazine*, t. 13); it grows 2 to 3 ft. high; variegata (*Bot. Mag.*, t. 2179) is a garden form of it. They like loam, with a fourth of peat and some sand. Propagation is by cuttings under a bell-glass. Cappadocica (syn. iberica), cream flowers in summer (*Bot. Mag.*, t. 2646); and varia, pink (*Bot. Mag.*, t. 258), are hardy trailers suitable for the rockery; they like loam, peat, and grit.

Corydalis, Fumitory (corȳd-alis, from *korydalos*, a lark, in allusion to the spur resembling a lark's. Ord. Fumariaceae).—A useful genus, as the plants will thrive in dry limestone soils, but C. lutea must be kept in hand, or it will become a weed. C. nobilis is good; it grows a foot high, and bears yellow flowers from May onward (*see* the *Botanical Magazine*, t. 1953). Wilsoni, grey leaves; and cheiranthifolia, cream flowers and fern-like foliage, are pretty. Any soil that is not wet and stiff suits. Propagation is by division in spring.

Corylus, Nut (cŏr-ylus, from *korys*, hood, referring to the nut being covered by the calyx. Ord. Cupuliferae).—*See* Fruit.

Corypha australis.—*See* Livistona australis.

Cosmos, Cosmea (cŏs-mos, from *kosmos*, beautiful. Ord. Compositae).—A small genus which includes one very useful plant in the annual bipinnatus; the type has purple flowers, but seedsmen sell mixtures which include the purple, white, and others; they flower profusely and long, and the leaves are prettily cut. The height is about 3 ft. (*see* Annuals for culture). C. diversifolius is a hardy tuberous perennial, with lilac flowers in September (*see* the *Botanical Magazine*, t. 5227); there is a dark variety called atro-sanguineus.

Cotoneaster (cotoneās-ter, from *cotonea*, quince (Pliny), and *aster* (ad instar), like. Ord. Rosaceae).—Hardy shrubs, suitable for growing against walls. Most of them grow from 4 to 6 ft. high, and thrive in any well-drained soil. Propagation is by seeds sown when ripe, by cuttings in spring or autumn, and by layers in autumn. The most popular species are microphylla and Simonsii; the former has small, glossy, evergreen foliage, and produces white flowers in spring, followed by scarlet berries (*see* the *Botanical Register*, t. 1114). Glacialis (syn. congesta) is a variety of it. Buxifolia is a dwarfer species sometimes used for rockwork.

Cotyledon, Navelwort (cotylē-don, name given by Pliny. Ord. Crassulaceae).—This, with the additions which have been made to it by modern botanists, is a very large genus. The Echeverias have been added to it, and so have the Pachyphytums and Umbilicuses, with some smaller genera. They are succulents, with glaucous foliage. The Cotyledons proper are of shrubby habit, whereas the Echeverias are low and flattened. The latter were more used in the old carpet-bedding days than they are now. Of the species

generally grown under the name of Cotyledon may be mentioned coccinea, scarlet; gibbiflora, pink and yellow; and orbiculata, red; all of which flower in late summer and are suitable for a cool greenhouse. The variety of gibbiflora called metallica, and other species such as glauca, retusa and its variety glauca, secunda and its variety glauca, and rosea, are commonly grown as Echeverias. These may be propagated by laying some of the outer leaves in sand in late summer, and taking off the little plants that form on them. The Cotyledons may be propagated by cuttings in summer; they must not be kept close. For soil use sandy loam. Although the Echeverias are used for the flower garden in summer, they should be wintered under glass. Cotyledon umbilicus, the British Navelwort, is hardy.

Couch Grass, Twitch (Triticum repens).—This, although a relative of wheat, is a dangerous weed, as its underground stems creep widely. They must be forked out, dried, and burned.

Couve Tronchuda.—*See* Kitchen Garden.

Cow-dung.—*See* Manures.

Cowslip, Primula veris.

Crab, Wild Apple (Pyrus acerba. Ord. Rosaceae).—*See* Fruit.

Crambe maritima (Seakale).—*See* Kitchen Garden.

Cranberry (Oxycoccus palustris. Ord. Vacciniaceae).—A fruit of little value. The American Cranberry, O. macrocarpa, is finer than the British. They are hardy evergreens, liking moist, peaty soil, and propagated by layers.

Crane Fly (Tipula oleracea).—*See* Daddy-longlegs.

Crane's-bill.—*See* Geranium.

Crassula (crăss-ula, from *crassus*, thick. Ord. Crassulaceae).—These succulents are allied to Kalosanthes and Rochea. The most popular species is coccinea, which grows about 18 ins. high and has scarlet flowers in summer (*see* the *Botanical Magazine*, t. 495). Jasminea, which has white flowers, blooms earlier, and is a smaller plant (*Bot. Mag.*, t. 2178). None of the other species are grown very much. The Crassulas thrive in loam with a third of leaf mould and a liberal admixture of sand and shattered brick. Cuttings of young shoots, dried in the sun for a few hours, then inserted in sandy soil in pots, root readily in summer. Give the plants a sunny position in early summer and abundance of water; reduce the supply of water in late summer, and cut the flowered shoots back; give hardly any water in winter.

Crataegus, Thorn (cratāē-gus, from *kratos*, strength. Ord. Rosaceae).—A most useful genus, giving us, as it does, the useful hedge "Quick" (*see* Flower Garden—Hedges), and a number of handsome species suitable for standard trees or wall bushes. The following are a few of the best: Coccinea, a handsome North American tree with white flowers followed by red fruit (*see* the *Botanical Magazine*, t. 3432); there are several varieties of it; Mespilus coccinea is a synonym. C. cordata, white, red fruit, is a late spring bloomer,

shown in the *Botanical Register*, t. 1151. C. crus-galli is the Cockspur Thorn, so called because the thorns are long and curved; white flowers in spring, followed by dark red berries; splendens is a good variety of it. C. Oxyacantha is the common British Hawthorn or "May," of which there are many garden varieties; one of these, praecox, is the Glastonbury Thorn, an early bloomer which legend says sprang from the staff of Joseph of Arimathaea; Paul's Double Scarlet, also the Double Crimson and Double White, are also varieties of the common Hawthorn, and make beautiful standard trees for lawns and shrubberies; they bloom in spring. C. Pyracantha is the popular wall shrub sometimes called the Fiery Thorn; it has various synonyms, such as Cotoneaster Pyracantha, Mespilus Pyracantha, and Pyracantha coccinea; there are several varieties of the Fiery Thorn, and one of the best is Lalandi (syn. Lelandi); they will thrive in town gardens, and hold their brilliant berries a long time if the birds spare them. The Thorns thrive in almost any soil. Standard trees should be staked securely. Propagation of the species is by seed; the special varieties are generally budded on to Oxyacantha. The Black Thorn is not a Crataegus; it is Prunus spinosa.

Creepers.—*See* Climbers.

Cress.—*See* Kitchen Garden.

Crinum (crī-num, from *krinon* (Greek), a Lily. Ord. Amaryllideae).—Bulbous plants, with beautiful flowers and handsome leaves. One or two species are nearly hardy, and may be grown outdoors in sheltered places in light, well-drained, friable soil; one of the best of these is Powelli, which grows about 3 ft. high and has red flowers in July; album, white; and rubrum, red, are forms of it. Moorei is very popular for pot culture in a warm house; it grows about 15 ins. high, and has rosy flowers in late spring (*see* the *Botanical Magazine*, t. 6113); there are white-flowered and variegated-leaved forms of it; Mackenii, Makoyanum, and Colensoi are synonyms. Longifolium is a hardy species, with pink flowers in July, growing about a yard high, and enjoying a moist spot; it has several synonyms, such as capensis, riparium, Amaryllis capensis and A. longifolia (*see* the *Bot. Mag.*, t. 661). Kirkii has red and white flowers in September (*see* the *Bot. Mag.*, t. 6512); it grows about 18 ins. high, and should be grown in a warm house. Giganteum is a tall, white-flowered species, blooming in July, and shown in the *Bot. Mag.*, t. 923; Amaryllis gigantea is a synonym; it requires a warm house. Loam, with a third of peat and some sand, suits the Crinums. Propagation is by offsets in spring, or by seeds.

Crocks.—*See* Drainage.

Crocus.—*See* Bulbs.

Croscosmia.—There is only one species, aurea, a South African bulb (ord. Irideae), growing 2 ft. high, and bearing orange flowers in July (*see* the *Botanical Magazine*, t. 4335). Bulbs should be planted 4 ins. deep in friable soil in autumn. The bulbs may be lifted in autumn and wintered like Gladioli. It is worth growing in pots, and the bulb soil (*see* Bulbs) will suit it.

Cross-fertilisation.—*See* Hybridisation.

Croton (crō-ton, from *kroton*, a tick, in allusion to the seeds. Ord. Euphorbiaceae).—The great beauty of the Crotons lies in their foliage, which is both graceful in form and beautiful in colour. It varies greatly, alike in shape and hue. In some the leaves are broad, and either upright or gently arched; in others they are narrow and twisted. Many colours are represented in them. Crotons are beautiful plants for table decoration, and it is customary to grow a collection for this purpose in most large places. The usual home of the plants is a warm, light house, kept moist by frequent syringing; heat, light, and moisture are, indeed, the principal requirements. With them the plants are healthy and rich in colour; without them, weak and dull. They like a compost of 3 parts loam, with 1 each of peat and leaf mould, and some sand. Propagation is by cuttings of firm young shoots in peat and sand under a bell-glass in heat in spring. Leggy plants are often dwarfed by cutting a slit in the stem, putting something in to hold it open, binding wet moss round, and keeping in a high temperature until roots have pushed, when the plants are removed and potted. The species are of no importance horticulturally, and need not be described. The seed of C. Tiglium yields Croton oil, a strong purgative. The following are beautiful varieties:—

Golden Chain, narrow, twisted; Golden Ring, narrow, twisted; Hawkeri, broad; Invicta, broad; Mortii, broad; Warrenii, narrow, twisted.

Crowfoot (Ranunculus).—A troublesome weed which must be kept under; it dies if forked out into sunshine.

Crown Imperial.—*See* Bulbs.

Cryptogam.—The non-flowering members of the vegetable kingdom were called cryptogams because their methods of increase were not obvious. The word comes from *kryptos*, hidden, and *gamos*, marriage—literally, concealed union. The flowering plants were called Phanerogams, from *phaneros*, visible, and *gamos*, marriage. They are now called Angiosperms.

Cryptomeria, Japan Cedar (cryptomē-ria, from *kryptos*, hidden, and *meris*, part, the flowers being hidden. Ord. Coniferae).—Only one species is grown to any extent, and that is japonica, a handsome tree, of which there are many varieties, different in habit; elegans (syn. Veitchii), Lobbii, nana, and spiralis are a few of the most popular. The Japan Cedar likes a deep, loamy soil and a sheltered situation. A dry, exposed spot is unsuitable.

Cuckoo-spit.—Many plants are soiled by spittle-like masses covering a green insect in summer. Syringing with a decoction of quassia water is a good remedy; or it may be brushed away.

Cucumber.—*See* Kitchen Garden.

Cuphea (cū-phea, from *kuphos*, curved, the form of the seed pod. Ord. Lythrarieae).—Graceful plants, with slender, tubular flowers. Only one species is grown to any extent, and that is ignea (syn. platycentra), which grows about a foot high, and has scarlet and

white flowers in June; there is a white variety called alba. Although not hardy they are often planted in beds for the summer. They can be raised from seed in winter, pricked off, potted singly, and then shifted to 6-in. pots if wanted for the greenhouse. Loam, with a fourth of decayed manure and sand, suits them. Cuttings may be struck in spring.

Cupidone.—*See* Catananche.

Cupressus, Cypress (cuprēss-us, from *kuo*, to produce, and *parisos*, equal, alluding to the symmetry. Ord. Coniferae).—One of the most useful of the smaller evergreen trees, giving us a number well suited to shrubbery borders, and others suitable for lawn specimens. They like a deep, loamy soil, and shelter from cold winds. Propagation is by seeds in spring, and by cuttings. Most nurserymen stock small plants of the best species and varieties, which are supplied cheaply, and may be planted in autumn or late winter. Much the most important species is lawsoniana (syn. Chamaecyparis Lawsoniana), a graceful Californian tree. Of its several varieties the following may be recommended: albo-spica, argentea, argenteo-variegata, erecta viridis, ericoides, gracilis pendula, lutea, and nana glauca; erecta viridis is particularly good. Macrocarpa, the Monterey Cypress, is also a Californian tree; Crippsii is a good variety of it. Nootkatensis is good and has several varieties. Obtusa, the Japanese Cypress, and its many varieties are frequently grown as Retinosporas. Pisifera, also grown under the name of Retinospora squarrosa, is useful; aurea and plumosa are two good varieties.

Currant.—*See* Fruit.

Currant, Flowering (Ribes).—*See* Flower Garden—Shrubs.

Cuttings.—Large numbers of cultivated plants may be propagated by cuttings, but the time and method differ so greatly that it is impossible to give general instructions. *See* the various plants.

Cyclamen, Sowbread (cȳc-lamen, from *kyclios*, circular, in allusion to the corm. Ord. Primulaceae).—*See* Bulbs.

Cyclobothra.—*See* Bulbs—Calochortus.

Cycnoches, Swan-neck Orchid (cycnō-ches, from *kyknos*, a swan, and *auchen*, neck, referring to the curved column. Ord. Orchidaceae).—A small genus of stove Orchids, requiring plenty of heat and moisture while growing, but little in the resting season. They do well in baskets of Sphagnum moss with abundance of crocks and a little fibrous peat. Propagation is by dividing the pseudo-bulbs.

Cydonia, Quince (cydō-nia, from *Cydon*. Ord. Rosaceae).—C. vulgaris is the Quince, which is much used as a stock for Pears (*see* Fruit). The best ornamental species are japonica and Maulei. The former is a popular plant for low walls, owing to its profusion of brilliant red flowers in spring. The fruit is sometimes jellied. The latter is also very handsome (*see* the *Botanical Magazine*, t. 6780). Modern botanists class the genus with Pyrus.

Cymbidium (cymbĭd-ium, from *kymbe*, a boat, in reference to a hollow in the lip. Ord. Orchidaceae).—Evergreen stove Orchids, with recurved leaves and large flowers. The most popular species is eburneum, which bears white, yellow-crested flowers late in winter (*see* the *Botanical Magazine*, t. 5126). Giganteum and Lowianum are also grown a good deal. Hybrids have been raised between the latter and eburneum. Lowianum does well in a cool house, and the hybrids will thrive in less heat than eburneum. The Cymbidiums should be grown in pots in fibrous peat and loam, and given a good deal of water while growing, but a reduced supply when growth is complete. Propagation is by division when growth starts.

Cynara.—C. Cardunculus is the Cardoon, and C. scolymus the Globe Artichoke. *See* Kitchen Garden.

Cyperus (cȳ-perus, the Greek name. Ord. Cyperaceae).—Ornamental Grass-like plants, very useful for table decoration. Loam, with a fourth of peat and some sand, suits. Propagation is by division when repotting in spring. They must have abundance of water. Alternifolius and its variegated forms are the most important; but elegans and laxus are also grown. All will thrive in a greenhouse.

Cypress.—*See* Cupressus.

Cypripedium, Lady's Slipper (cypripē-dium, from *kypris*, Venus, and *podion*, slipper, from the slipper-like form of the lip. Ord. Orchidaceae).—A large and highly important genus of Orchids, comprising hardy as well as tender species. Hybridisation has been extensively practised with this genus, the result being that the considerable list of species has been added to by some hundreds of cross-breds, many of which are very beautiful; they are, however, expensive to a degree in some cases, and can only be specialised by wealthy people. Most of the Cypripediums are evergreen, but the hardy kinds are deciduous. The indoor kinds should be grown in pots with plenty of crocks, the compost being made up of fibrous peat, loam, and Sphagnum moss. The hardy kinds love a cool, moist peat bed in a sheltered place. Repotting for the tender kinds is best done when they start growing in spring, at which period strong plants may be divided. They like abundance of moisture both at the roots and in the atmosphere. The following are the principal species and varieties:—

Warm House.

barbatum (*Botanical Magazine*, t. 4234), several varieties.
bellatulum and variety album; these, unlike the majority, should be rested in autumn.
Boxalli.
callosum and variety Sanderae.
caudatum.
Charlesworthii.
Fairieanum (*Bot. Mag.*, t. 5024).
hirsutissimum.

Lawrenceanum and variety Hyeanum.
niveum (*Bot. Mag.*, t. 5922).
Rothschildianum (*Bot. Mag.*, t. 7102).

The colours are mostly combinations of green, brown, yellow, white, and purple.

Cool House.

insigne and varieties Chantinii, Sanderae, Sanderianum, etc.
Schlimii and variety albiflorum.
Spicerianum.
villosum and variety aureum.

Hardy.

Calceolus, yellow.
guttatum, rose and white.
macranthum, purple.
pubescens, brown and yellow.
spectabile, rose and white (Moccasin Flower).
,, album, white.

For the newest hybrids it is well to consult a modern work on Orchids; Leeanum, Harrisianum, Morganiae, and Sedeni are good and inexpensive.

Cyrtomium falcatum.—This popular fern is now called Aspidium falcatum.

Cystopteris, Bladder fern (cystŏp-teris, from *kystos*, a bladder, and *pteris*, fern. Ord. Filices).—A small genus, of which the most important species is fragilis, a hardy British fern, liking a compost of loam, peat, and leaf mould, with sand; there are several varieties. Propagation is by division when growth starts in spring.

Cytisus, Broom (cȳt-isus, from *Cythrus*. Ord. Leguminosae).—Beautiful shrubs, nearly all hardy, and thriving in light, sandy soil. They are allied to Genista, and the yellow species racemosus is extensively grown for market under the name Genista racemosa. Of the principal species, Ardoini, with yellow flowers, is good for the rock garden. Kewensis is a fine hybrid of prostrate habit, with creamy flowers, hardy. Praecox, pale yellow, very early, is also hardy, and makes a nice bed; as does albus, with white flowers in spring. Racemosus or fragrans should be grown in pots for the greenhouse; it may be propagated by cuttings in spring, and with a little pinching soon makes a nice bush; the plants will flower the following spring. Scoparius is the common yellow Broom; a more important plant is its variety andreanus, which has beautiful brown and yellow flowers; sulphureus is a pale yellow variety of scoparius. Dallimorei, mauve, is a hybrid (albus × andreanus). Purpureus and its varieties, and decumbens, are good for the rockery. *See also* Genista and Laburnum. The choicer Brooms are grafted on Laburnums, especially for standards; but cuttings will root in a frame in autumn.

Daboëcia (daboē-cia, St. Dabeoc's Heath. Ord. Ericaceae).—A small genus of low evergreen shrubs, much the most important species of which is polifolia, also called Menziesia polifolia. It is a

lovely little shrub, growing about 2 ft. high, neat in habit, and bearing abundance of purplish flowers. It is a native of Ireland, and thrives in peat or loam. There are several varieties, of which the most desirable is the white, alba. Propagation is by cuttings and layers.

Dactylis (dāc-tylis, from *daktulis*, finger-breadth. Ord. Gramineae).—D. glomerata is the familiar Cocksfoot Grass, much used in pastures. There is a variegated form which is used in flower gardening. It thrives in ordinary soil, and is propagated by division. Not quite hardy.

Daddy-longlegs.—The Crane fly, Tipula oleracea, is dangerous to gardeners as the parent of the leather-jacket grub, which is very troublesome in new gardens; it is larger than the wireworm, and darker in colour. Regular cultivation, and trapping with Potato slices impaled on sticks near cherished plants, reduce their numbers. Vaporite or Apterite may be dug in in spring. Starlings clear off large numbers of the flies when they come out of the turf at the end of summer.

Daffodil.—*See* Bulbs.

Dahlia (popularly dā-hlia, correctly dāh-lia, named after Dahl, a



A Dahlia raised from a Cutting.



Propagating Dahlias by division of the Rootstock.
1. Tubers. 2. Points of detachment.

Swede. Ord. Compositae).—A native of Mexico, the Dahlia is not hardy in northern climes, and may be killed in winter if left out of doors unprotected, although in friable, well-drained soils it may survive, especially if some litter is thrown over the rootstock after the tops have been killed by frost. The species are not cultivated, as they are so much inferior to the garden varieties which have been raised from variabilis, coccinea, Merckii, and Juarezii as to be unworthy of places. The horticultural forms are so numerous, and so varied in type, that it has been found necessary to classify them; thus we have: (1) *Show*, (2) *Fancy*, (3) *Cactus*, (4) *Decorative*, (5) *Pompon* or *Bouquet*, (6) *Single*, (7) *Paeony-flowered*, and (8) *Pompon-Cactus*. Classes 1, 2, and 5 have double, symmetrical flowers, the petals folding over each other evenly from bottom to top, where no green must show; Nos. 1 and 2 only differ in colour; Shows have two colours at the most, Fancies three; Pompons are one-coloured flowers about a quarter the size of the Show and

Fancy. Classes 3 and 4 have quilled florets, spreading from the centre to the circumference; the Cactus have pointed florets, the Decorative blunt ones. Pompon-Cactus are practically a small type of Cactus, not quite so loose and "feathery." Paeony-flowered have large, irregular flowers, thrown up well above the leaves. All require the same culture, unless it be a somewhat modified system of pruning for Single and Pompon, which may be allowed to carry more branches than the larger types.

Propagation is effected by seeds, cuttings, and division. If seed is sown in pots or boxes of gritty soil in winter, put in a warm frame or house, the seedlings pricked out, hardened in a cool place, and planted out in rich soil in June, they will flower the same year. The flowers will be good or bad from the florists' point of view according to the quality of the strain sold by the seedsmen, but they are hardly likely to be equal to the best named varieties. A beginner who wants to be sure of a good type will do well to buy plants of recognised varieties in spring for June delivery. He can increase these by cuttings the following spring if he likes to lift the tubers in autumn, store them in a dry, frostproof place for the winter, and put them in a warm, light place in March; for they will push up young shoots which can be taken off at 3 ins. long, inserted singly in small pots, placed in a warm house or frame, and covered to exclude air. Propagation by division can be effected by separating the tubers that form the rootstock from each other, starting them in pots or boxes, and then planting them out.

Soil.—Dahlias love a deep, fertile, moist soil (*see* Kitchen Garden—Bastard trenching). The ground should be dug and manured a few weeks before planting, to allow for settling. Water and liquid manure will be helpful in dry weather. If they grow slowly at first, dissolve an ounce of nitrate of soda in a gallon of water and give them a good soaking.

Pruning.—If the branches threaten to become thick some of them should be cut out, as it is desirable to keep the centre of the bushes open.

Earwigs.—These must be trapped with hollow Bamboo or Bean stalks, or with small pots filled with hay. Staking must be thorough. It is best to fix strong stakes when planting an inch square and 5 to 6 ft. long. They may be painted green and the base tarred. The tying should be secure.

Varieties.—The following are good in the various sections:—

Show.

A. M. Burnie, orange
Blush Gem, white, mauve tips
Crimson King, deep red
Ethel Britton, purple and white
Golden Gem, yellow
James Cocker, purple
John Walker, white
Mrs. Gladstone, blush
R. T. Rawlings, yellow
Queen of the Belgians, cream and pink

Fancy.

Chorister, fawn
Comedian, orange, crimson, and white
Dorothy, fawn and maroon
Gaiety, yellow, red, and white
Mabel, lilac and crimson
Matthew Campbell, buff and crimson
Mrs. Saunders, yellow and white
Peacock, maroon and white
Novelty, purple and rose

DAHLIAS—*continued.*

Cactus.

Brigadier, crimson
Britannia, salmon
Buttercup, yellow
C. E. Wilkins, salmon-pink
Dainty, pink, primrose centre
Daisy Easton, yellow
Electra, primrose, white tips
Floradora, dark red
Galliard, carmine
Harbour Light, orange
Harold Peerman, yellow
Ibis, orange
Ivernia, salmon-fawn
Nisi Prius, vermilion
Radium, orange, suffused rose
Revd. Arthur Hall, ruby
Ruby Grinsted, yellow and fawn
Saturn, fancy colours

Single.

Beauty's Eye, mauve, crimson ring
Columbine, rose and orange
Duke of York, scarlet
Formosa, crimson, yellow centre
Leslie Seale, lilac
Miss Roberts, yellow
Peggy, buff, suffused magenta
The Bride, white

Pompon.

Adelaide, pink, suffused heliotrope
Bacchus, crimson
Buttercup, yellow
Midget, orange
Nerissa, white and rose
Phoebe, orange
Queen of the Whites
Sunny Daybreak, apricot
Tommy Keith, red, white tips

Pompon-Cactus.

Freedom, scarlet
Goldfinch, yellow, rose tip
Mary, orange, white tip
Mignon, lilac-rose
Peace, cream
Sovereign, yellow
The Bride, white

Paeony-flowered.

Codsall Rose, yellow
Garibaldi, maroon
King Leopold, crimson
Lady Saville, art shade
Loveliness, pink
Paul Kruger, crimson
Mrs. T. G. Baker, white
Solfatara, scarlet
Warrior, dull red

Decorative.

Avoca, crimson
Glare of the Garden, scarlet
Grand Duke Alexis, white
Sea Shell, pink
Yellow Colosse, yellow

Dwarf Single (about a foot high).

Bootles, white
Golden Fairy, yellow
Mignon, pink
Tom Tit, orange

The Show, Fancy, and Cactus are the most esteemed for exhibition, the Single and Cactus are the most pleasing as flowers, the Pompon and Paeony-flowered are the best for the garden. The last have huge flowers with broad, almost flat florets, and as the blooms are thrown up above the leaves on long, thick stems they are fine plants for making bold colour groups. The Pompon-Cactus are charming for cutting.

Collarette Dahlias are a small class. They are single flowers, with a ring of short florets round the centre. *Star* Dahlias are singles with widely diverging florets. These are both modern classes, which may be watched for future developments by Dahlia lovers.

Daisy.—*See* Bellis.

Damask Rose.—*See* Rose.

Damask Violet.—*See* Hesperis.

Dame's Rocket.—*See* Hesperis.

Damping-off.—A phrase used by gardeners to describe the collapse of seedlings at the surface of the soil. It is directly caused by a fungus, but indirectly by too much moisture and insufficient air. *See* Watering.

Damson.—*See* Fruit.

Dandelion.—This plant is a nuisance on lawns, and should be kept under by vigorous spudding out. It is useful as a salad. *See* Kitchen Garden.

Daphne (dāph-ne, after the nymph Daphne. Ord. Thymelaeaceae).—Pretty dwarf shrubs with fragrant flowers, which are borne in late winter and early spring. Some are evergreen and others deciduous. Blagayana is a spring-blooming trailer with sweet white flowers, suitable for the rock garden. Cneorum is also an evergreen trailer, and produces its fragrant pink flowers in spring (*see* the *Botanical Magazine*, t. 913); there is a large-flowered variety called grandiflorum, and also one with variegated leaves. Mezereum (the Mezereon) is a great favourite, although not evergreen; its pinkish flowers come in late winter before the leaves, and are deliciously perfumed; there are white and other varieties, including a late summer bloomer. Odora (syn. indica) is evergreen, and its purple flowers are very sweet; it should be grown in a greenhouse; Mazelli, white or blush, is probably a variety of it; it blooms earlier, and is also sweet. They do well in peat, but a liberal addition of loam should be made for Mezereum. The trailers are propagated by layering in autumn, the others by cuttings under a bell-glass in autumn, in sandy peat. In nurseries grafting on to D. Laureola, the Spurge Laurel, is practised.

Darlingtonia californica (darlingtō-nia, after Dr. Darlington. Ord. Sarraceniaceae).—An interesting half-hardy plant suitable for outdoor culture in a peaty bed in mild districts, but otherwise needing glass shelter. It loves moisture. The green, yellow, and red flowers are produced in spring. It may be propagated by division when it starts growing. *See* the *Botanical Magazine*, t. 5920.

Date Palm, Phoenix dactylifera.

Datura, Thorn Apple (datū-ra, from the Arabic *Tatorali*. Ord. Solanaceae).—Although poisonous plants, these are worth attention for their beautiful flowers. Fastuosa is an annual, growing about 2 ft. high and producing blue and white flowers in summer; there are several varieties, including a double. Suaveolens is a beautiful greenhouse shrub, with large white fragrant flowers in August; it is sometimes called Knightii, and it is also grown as Brugmansia suaveolens. Meteloides (syn. Wrightii) is a greenhouse shrub with white flowers in early summer. Stramonium, which grows 2 ft. high and produces white flowers in August, is the Thorn Apple, the large, spiny fruit of which is familiar in autumn; it is a British plant. The annuals are raised from seed in spring, the shrubs by cuttings under a bell-glass in spring or summer, with bottom heat. Sandy loam suits.

Daucus (Carrot).—*See* Kitchen Garden.

Davallia, Hare's-foot fern (davāll-ia, after Signor Davalli. Ord. Filices).—A large genus of ferns, several of whose members are very handsome in pots and hanging baskets in warm greenhouses. They thrive in loam and leaf soil, with a little peat and sand. Add Sphagnum moss for basket plants. Propagation is by spores (*see* ferns), and division of the rhizomes, or creeping stems (the likeness of these to a hare's foot has given the popular name), in the case of canariensis, which will thrive in a cool greenhouse or room. They all love moisture. The " fern balls " seen in shops are made of the pliable dry rhizomes of D. bullata Mariesii packed with Sphagnum moss. A few of the best species are canariensis, dissecta, elegans, hirta cristata (syn. Microlepia hirta cristata), and pallida (syns. Moorei and Mooreana).

Day Lily (Hemerocallis).—*See* Bulbs.

Dead Nettle, Lamium.

Deciduous.—A term applied to plants which shed their leaves annually.

Delphinium, Larkspur (delphīn-ium, from *delphin*, a dolphin, referring to the resemblance of the spur to a dolphin's head. Ord. Ranunculaceae).—A large and important genus of hardy herbaceous perennials, valuable for colour groups in large borders. For culture and uses, *see* Flower Garden. Of the species, Ajacis is the annual Rocket Larkspur, and consolida is the parent of the annual branching Larkspur. Nudicaule, growing about 18 ins. high, with scarlet flowers in summer, is used in borders. *See* the *Botanical Magazine*, t. 5819. Few other species are grown, preference being given to the garden forms which have been raised from cheilanthum, elatum, grandiflorum, peregrinum, and formosum. The following are beautiful varieties:—

Autolycus, Beauty of Langport, Belladonna, King of Delphiniums, Persimmon, and True Blue.

There is a charming variety called Blue Butterfly, which, raised from seed in a frame in spring, blooms the same year; thus treated it only grows about 9 ins. high.

Dendrobium (dendrō-bium, from *dendron*, tree, and *bios*, life, in allusion to their growing on trees. Ord. Orchidaceae).—A large and beautiful genus of epiphytal Orchids, requiring a warm house. In the growing season they enjoy abundance of heat and moisture, but they may be kept cooler and drier when growth is mature. They may be grown in pots or baskets, and should be potted when new growth begins. Use crocks liberally, and pack a mixture of fibrous peat and Sphagnum moss about the roots. The erect growers, such as nobile, thyrsiflorum, densiflorum, and fimbriatum, may be grown in Orchid pots; but those of pendulous habit are best in baskets. The winter temperature may range from 50° to 60°, spring 60° to 70°, summer 65° to 85° (with sun heat), autumn 60° to 70°. The following are some of the principal species and varieties:—

aureum, red and yellow, winter, sweet.
Brymerianum, yellow, winter.
densiflorum, orange, spring.
fimbriatum oculatum, orange and maroon, spring.
formosum giganteum, yellow and white, spring.
infundibulum, orange and white, early summer.
nobile, purple, rose, and white, winter.
Phalaenopsis, mauve, autumn.
Pierardii, white, spring.
speciosum, buff, winter.
superbum, purple, spring.
Wardianum, purple, orange, and white, winter.

There are many hybrids, which are seen at the principal shows and in the collections of specialists. For details of parentage a modern work on Orchids should be consulted.

Deodar.—*See* Cedrus.

Desfontainea (desfontāīn-ea, after M. Desfontain. Ord. Loganiaceae).—There is only one species, and that is spinosa, a dwarf hardy evergreen shrub producing beautiful scarlet and yellow flowers in summer. It is well worth including in the shrubbery, near the front, and it is not particular as to soil, so long as the ground is not stiff and damp. It is suitable for pot culture. Propagation is by cuttings in a mixture of loam and peat, with sand, under a bell-glass, preferably with bottom heat. *See* the *Botanical Magazine*, t. 4781.

Deutzia (dēūt-zia, after J. Deutz. Ord. Saxifrageae).—A valuable genus of deciduous shrubs, quite hardy, but in one or two cases so early in bloom as to have the flowers injured by late frosts. This renders it desirable to plant them where they will have shelter from other shrubs. They are quite easy to grow, thriving in ordinary soil. Gracilis is sold by bulb dealers in autumn in the form of prepared roots, which are put in 6-in. pots in bulb soil (*see* Bulbs) and grown for flowering in the greenhouse in winter and spring. Crenata flore pleno, double white, is the best of the garden kinds; it is an early and profuse bloomer. The old wood may be pruned out after flowering, and the young, of which there will be abundance if the soil is good, retained for the following year. Propagation is by cuttings of young wood removed with a heel in spring, and inserted in sandy soil. They root best when kept close. Or division may be practised when growth starts. Lemoinei is a dwarf white hybrid, and scabra a tall, strong species.

Devil in the Bush (Nigella).—*See* Annuals.

Dewberry (Rubus caesius).—A hardy deciduous British shrub, growing about 2 ft. high, and with white flowers in June. The fruit is of no importance.

Dianthus (diān-thus, from *dios*, divine, and *anthos*, a flower—Jove's Flower. Ord. Caryophyllae).—A most valuable genus, giving us, as it does, the Carnation (*see* Carnation), the Pink (*see* Carnation), the Picotee (*see* Carnation), the Indian Pink (*see* Biennials), and the Sweet William (*see* Biennials); in addition to many beautiful species

suitable for the rockery (*see* Flower Garden). D. caryophyllus is the Carnation, D. plumarius the garden Pink, D. barbatus the Sweet William, and D. chinensis the Indian Pink. The following are the best Alpines; all thrive in sandy loam in crevices: alpinus, red, June (*Botanical Magazine*, t. 1205), top-dress annually with fresh soil; caesius, the Cheddar Pink, pale pink, July, enjoys limestone chips; cruentus, scarlet, July; deltoides, the Maiden Pink, pink, June; glacialis, red, June, likes a sunny aspect and a gritty soil containing leaf mould; neglectus, rose, June; and superbus, white, summer (*Bot. Mag.*, t. 297). Atkinsoni, May, 9 ins., crimson, is brilliant, and likes shade.

Diascea (diā-scea, from *diaskeo*, to adorn, in reference to the beauty. Ord. Scrophularineae).—One species is esteemed, both for greenhouse and flower-garden culture, and that is Barberae, a half-hardy annual with rosy flowers in early summer, growing about a foot high (*see* the *Botanical Magazine*, t. 5933). For culture, *see* Annuals.

Dibber, Dibble.—A short pointed wooden tool useful for planting greens.

Dicentra (dicēn-tra, from *dis*, twice, and *kentron*, spur, in reference to the form. Ord. Fumariaceae).—The old and popular name is Dielytra. Spectabilis, with its beautiful pink pendent flowers, is much the most popular, and is good both for herbaceous borders and pots (*see* Bulbs). Eximia and formosa are also worth growing in the herbaceous border. The former is illustrated in the *Botanical Register*, t. 50; and the latter in the *Botanical Magazine*, t. 1335.

Dicksonia (dicksō-nia, after Mr. J. Dickson. Ord. Filices).—A genus of handsome ferns, some of which are classed with the tree ferns. They thrive in a compost of 2 parts loam, 1 leaf mould, and a liberal dash of sand. Propagation is by spores (*see* Ferns). Like most ferns, they enjoy abundance of water. Antarctica is the principal species.

Dictamnus, Dittany (dictām-nus, Virgil's name. Ord. Rutaceae).—The species Fraxinella, the Burning Bush or Bastard Dittany, is interesting on account of the stems being covered with resin, which burns if touched with a lighted match at night. It is a hardy herbaceous plant, bearing its white flowers in late spring. It conforms to the general treatment of its class, but does not lend itself to division, and may therefore be propagated by seed. The purple is a variety, although the two are often grown in the reverse way, *i.e.*, the purple as the species. Giganteus (caucasicus) is a large form.

Dieffenbachia (dieffenbāch-ia, after Dr. Dieffenbach. Ord. Aroideae).—Handsome foliage plants, suitable for warm houses. A compost of loam, with a third of peat and leaf mould, and some sand, suits them. They have a distinct growing season, during which they must have abundance of moisture, both at the root and in the atmosphere; less water will be needed when they go to rest in autumn. They should be shaded from hot sunshine. Cuttings of young shoots will strike in heat in spring, and so will pieces of stem. Three of the principal species are Chelsoni, Imperator, and picta.

Dielytra.—*See* Dicentra and Bulbs.

Diervilla, Weigela (diervill-a, weigē-la, the former after Dr. Dierville, the latter after C. E. Weigel. Ord. Caprifoliaceae).—These are amongst the most beautiful of deciduous shrubs, and should be grown in every garden. Thriving in almost any well-drained soil, there are few places in which they will not succeed. In deep, friable, manured ground, and with adequate moisture, they will throw up a considerable number of shoots every year, and the best placed of these should be selected for a well-shaped bush, the others being removed after flowering, as the new shoots will bloom well the following year. Rosea (florida or amabilis) is the principal species; it has rose flowers in spring. Abel Carrière, Eva Rathké, and Van Houttei are three fine varieties.

Digging.—The fertility of the soil turns greatly on the tillage, and proper digging has great influence. The digger should have both spade and fork, large, and made of steel. In some states of the soil the spade is the better implement, in others the fork; experiment quickly decides which should be chosen. Ground is best dug when damp, but not sodden with recent rain. The blade or prongs should be driven in with the foot at an angle of about 45°, then the handle depressed, the lower hand slid down to the base, and the portion lifted and turned over. It is well to throw it a little forward in turning, so as to keep a small trench open, into which the manure that has been spread can be placed. By working in a straight line across the piece, and digging evenly, a perfect level is maintained. It is a good plan to begin digging a piece of ground by taking out a "spit" of soil and wheeling it to the other end, as there is then an open trench all the way, and material at hand to fill the last one with. Annual weeds should be buried as the work proceeds, perennial ones forked out, dried, and burned.

Digitalis, Foxglove (digitā-lis, from *digitale*, a finger-stock, in allusion to the shape. Ord. Scrophularineae).—The Foxglove is an old favourite, and seedsmen now sell splendid strains of the old species purpurea. There is a form (campanulata) which bears flowers at the top of the stem. Of the other species ambigua is one of the best. It has yellow flowers. For Foxglove culture, *see* Biennials.

Dill.—*See* Kitchen Garden—Herbs.

Dimorphotheca (dimorphothē-ca, from *dimorphos*, two-formed, and *theca*, receptacle, the disc having different forms of floret. Ord. Compositae).—An unimportant genus, but the species aurantiaca, which grows about a foot high and bears a profusion of orange flowers in summer, has come to the front in recent years. For culture, *see* Annuals—Half-hardy.

Dioecious.—A species with separate male and female flowers on separate plants.

Dionaea, Venus's Fly-trap (dionāē-a, from Dione, a name of Venus. Ord. Droseraceae).—The only species, muscipula, is interesting from the fact that the bristles on the leaf lobes are irritable,

and when a small insect alights the leaf closes over it. It should be grown in a greenhouse, in a compost of peat and Sphagnum moss. As it loves moisture the pot may be stood in a saucer of water. The white flowers are borne in July. Propagation is by seeds or division. A coloured plate appears in the *Botanical Magazine*, t. 785.

Diplacus (dip-lācus. Ord. Scrophularineae).—One species is grown a good deal, and that is glutinosus, which botanists now call Mimulus glutinosus. It is a greenhouse shrub, with small orange flowers and sticky foliage. Loam, with a fourth of leaf mould and some sand, suits it. Propagation is by cuttings under a bell-glass in summer.

Dipladenia (dipladē-nia, from *diploos*, double, and *aden*, gland; there are two glands in the ovary. Ord. Apocynaceae).—Very beautiful evergreen twiners, producing abundance of large, brilliant flowers in a warm greenhouse. They are sometimes trained up pillars, but more frequently on balloon-shaped trellises fixed in large pots; when the frame-work is well covered and the plants are in full bloom the former make lovely objects. Peat and loam, the former preponderating, with sand, suit them. Repotting is best done in spring, when growth begins. When in full growth they will delight in large quantities of water, but after flowering the supply may be reduced. A moist atmosphere should be maintained by syringing. Propagation is by cuttings of the young shoots in spring. They ought to be put in a propagating case, or in bottom heat with a bell-glass over them. Amabilis, rose; boliviensis, yellow and white (*Botanical Magazine*, t. 5783); and splendens, carmine (*Bot. Mag.*, t. 3976), are three of the best kinds.

Disa (dī-sa, a native name. Ord. Orchidaceae).—A small genus of Orchids, not much grown except in the case of grandiflora, which is a great favourite, partly because of its brilliant colour, and partly because it will thrive in a cool house. It should be grown in pots, liberally crocked, and filled with a mixture of fibrous peat and Sphagnum moss; a little charcoal may be added for sweetening. Early winter is the period for repotting. Little water will be needed until the plants are seen to be rooting freely, when regular and abundant supplies must be given; at the end of the growing season the supply must be reduced and the plants rested. Propagation is by division when repotting. There are varieties of grandiflora, and superba is very good.

Disbudding.—A term applied to the thinning out of growths or flower buds, in the former case to prevent too much wood, in the latter to get fewer but finer flowers. *See* Fruit, Carnations, etc.

Dittany.—*See* Dictamnus.

Dodecatheon, American Cowslip (dodecā-theon, a name given by Pliny. Ord. Primulaceae).—These pretty flowers thrive in sandy peat in cool, shady spots on the rockery or in the border. Propagation is by division or seeds in spring. There are many forms of D. Meadia. Giganteum is one of the best.

Dog Rose, Rosa canina.

Dog's Tooth Violet.—*See* Bulbs.

Dogwood.—*See* Cornus.

Doronicum, Leopard's Bane (dorōn-icum, from *doronigi,* the Arabic name. Ord. Compositae).—*See* Flower Garden—Herbaceous plants.

Dove Orchid.—*See* Peristeria elata.

Draba, Whitlow Grass (drā-ba, from *drabe,* acrid. Ord. Cruciferae).—*See* Flower Garden—Rockery.

Dracaena (dracāē-na, from *drakaino,* a female dragon. Ord. Liliaceae).—Handsome foliage plants, some nearly hardy, others requiring a hothouse. With care some kinds can be kept healthy in living-rooms, the principal requirements being proper watering (*see* Watering), a weekly sponging with tepid water, ventilation without draughts, and a light position. Repotting should be done in spring when necessary, but 6-in. pots are generally large enough, and in preference to shifting on the balls can be reduced, and the plants put in the same size of pot, with some fresh soil well rammed down around the ball. Loam, with a third of decayed manure, and sand, suit. When the plants get leggy they can be shortened like Crotons, which see. Propagation is effected by cutting up pieces of stem in spring, each with a joint, and laying them in moist soil or cocoa-nut fibre refuse in bottom heat. As we have seen under Cordyline, these two genera are related, and several plants which, strictly speaking, are Cordylines are grown as Dracaenas. The following are some of the best:—



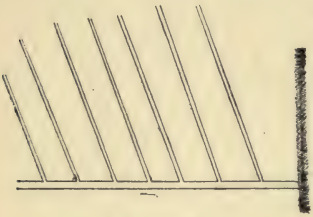
PROPAGATING DRACAENAS BY PIECES OF OLD STEM.
1. Drainage. 2. Rough soil. 3. Fine soil. 4. Piece of stem.

Australis, A. lentiginosa, A. lentiginosa Russelli, Baptisti, Chelsoni, fragrans Lindeni, Goldieana, indivisa terminalis.

Dracocephalum, Dragon's Head (dracocēph-alum, from *drakon,* dragon, and *kephale,* a head. Ord. Labiatae).—Pretty summer-flowering hardy herbaceous plants. For culture, *see* Flower Garden—Herbaceous plants. Ruyschianum, with purplish-lilac flowers in early summer, growing about 2 ft. high, is one of the best. Grandiflorum, blue, 6 ins. high, is suitable for the rockery.

Drainage.—This subject may be considered under two heads horticulturally, the drainage of garden ground and the drainage of flower-pots. Drain-pipes should not be laid until the necessity has been proved, as the process is laborious and expensive; moreover, it is possible to make ground too dry. A simple test is to dig holes 30 ins. deep in winter, cover them to exclude rain, and see if water rises into them and stands after a spell of wet weather. If water lodges in the upper strata of soil the latter is likely to become sour, stiff, and unsuitable for crops. Before laying drain-pipes look out for a spot where there is a fall, and let the main drain lead to it. If

it is a ditch or river, the water is carried off the place, otherwise a small pond may be formed in the grounds and made ornamental (*see* Flower Garden—Water plants). The trenches for the pipes may be 30 ins. deep and 15 ft. apart in stiff soil, 3 ft. deep and 20 ft. apart in lighter ground. Two-inch earthenware drain-pipes 12 ins. long are suitable, and the cost is about 30 shillings per 1000; the ends may be left open. Care must be taken that the bed of the trench is perfectly firm and level. The pipes may be laid in diagonal lines leading to the main drain. With a proper fall and outlet, water cannot lie near the surface in ground thus treated. Flower-pots are provided with a bottom-hole in order to allow superfluous water to escape, but in the absence of drainage material the soil would fall through. By laying crocks (broken flower-pot) over the hole the soil is upheld, but water is allowed to escape. It is best to choose one large piece for the bottom layer, and place it concave side downward, then cover with smaller bits arranged so as to overlap. With a little clean moss or a few flaky portions of compost over all perfect drainage is provided, but a few pieces of charcoal are an improvement. Pots for Orchids are filled two-thirds full of drainage, to allow for the large quantities of water needed.



How to drain Land.

Diagonal pipes 15 to 20 ft. apart, leading to a drain-pipe which discharges in a ditch.

Drosera, Sundew (drōs-era, from *droseros*, dewy. Ord. Droseraceae).—Interesting insectivorous plants. D. rotundifolia is a British plant, covered with glandular hairs that sparkle with moisture. It likes a cool, moist spot, with peaty soil. Propagation is by division. Binata and filiformis are pretty exotic species. All may be grown in pots for the greenhouse if desired, peat with a surfacing of Sphagnum moss being used.

Dryas (drȳ-as, from *dryades*, wood-nymph, referring to the Oak-like leaves. Ord. Rosaceae).—The best-known species is octopetala, which is a British evergreen shrub, and has white flowers in early summer. A trailer, it is suitable for the rockery. It thrives in loam, peat, and sand, and may be propagated by division in spring.

Dutchman's Pipe, Aristolochia sipho.

Dyer's Green Weed, Genista tinctoria.

Earwig.—When present in large numbers the earwig is a great trial to gardeners, attacking both plants and flowers. Traps of hay in small flower pots inverted on stakes should be set.

Eccremocarpus (eccremocār-pus, from *ekkremes*, pendent, and *karpos*, fruit. Ord. Bignoniaceae).—The only popular species, scaber, is much esteemed as a trailer, both indoors and out. It produces orange flowers freely in July. It may be treated as a half-hardy annual (*see* Annuals). It is illustrated in the *Botanical Magazine*, t. 6408 (syn. Calampelis scaber).

Echeveria (echevēr-ia, after M. Echeveri. Ord. Crassulaceae).—*See* Cotyledon.

Echinocactus (echinocāc-tus, from *echinos*, hedgehog, and *cactus*. Ord. Cactaceae).—*See* Cactus.

Echinops, Globe Thistle (echī-nops, from *echinos*, hedgehog, and *opsis*, like. Ord. Compositae).—E. ritro is a hardy herbaceous perennial growing about 3 ft. high and resembling the Eryngiums. Its blue metallic flowers are produced in summer (*see* the *Botanical Magazine*, t. 932). For culture, *see* Flower Garden—Herbaceous plants.

Echinopsis (echinōp-sis, from *echinos*, hedgehog, and *opsis*, like. Ord. Cactaceae).—*See* Cactus.

Echium, Viper's Bugloss (ē-chium, from *echis*, a viper, the resemblance of the seeds to a viper's head. Ord. Boraginaceae).—The species vulgare is the Viper's Bugloss. It is a biennial, growing about 3 ft. high, and with violet flowers in July. There is a white variety, alba. For culture, *see* Biennials. Candicans, with rosy flowers; fastuosum, blue, and one or two others, are occasionally grown in the greenhouse.

Edelweiss (Leontopodium alpinum. Ord. Compositae).—A silvery-leaved Alpine with white flowers, easily grown on the rockery, but the better for protection from rain with a square of glass through the winter. It may be raised from seed in spring.

Edgings.—There are various ways of providing edgings to beds and borders. Some like Box (*see* Box), others grass, others tiles. Something is required in order to keep the soil off the walks. Nothing looks better than a broad band of grass about 2 ft. wide; when regularly mown, the outer edge neatly clipped, and the soil thrown well back from the inner edge, it forms a cool foil both to gravel and flowers. Such a band is best made with turves. Tiles look neat but mechanical; if used, a dwarf plant should be grown near, such as the Viola, Virginian Stock, Cerastium, Crocus (for spring), Thrift, or London Pride. A charming edging may be made with stones placed irregularly in a bed of good soil, and the interstices planted with Alpine plants. *See* Flower Garden—Rockery.

Egg Plant.—*See* Kitchen Garden.

Eglantine.—*See* Rose.

Eichornea (eichōr-nea, after Herr Eichorn. Ord. Pondeteriaceae).—Aquatics that require a tank in a warm house. Propagation is by division in spring. Speciosa, with blue flowers in summer, is grown a little.

Elaeagnus, Wild Olive (elaeāg-nus, from *elaeagnos*, name given by Dioscorides. Ord. Eleagnaceae).—Handsome shrubs, including several evergreens, which, with their green or variegated foliage and berries, are good for winter effect. They are not particular as to soil, and are easily propagated by cuttings in autumn. Angustifolia, with yellow flowers in May; macrophylla, yellow; autumn bloomer; multiflora, leaves silvery below; and pungens, leaves

silvery below, an evergreen, are good. Aurea marginata, glabra aurea, and Simoni variegata are handsome garden varieties.

Elder, Sambucus (sambū-cus. Ord. Caprifoliaceae).—Few small trees are more familiar than the common Elder, with its white perfumed flowers in early summer, followed by black fruits. It is a soft-wooded tree, apt to grow straggly and to be ugly in winter unless carefully pruned. Any well-drained soil suits it. Propagation is by cuttings from which the buds on the lower part have been removed. The common species is S. nigra, but there are several garden varieties of it, such as foliis aureis, golden; and variegata, silvery. Viridis has green and racemosa scarlet berries.

Elecampane, Inula Helenium.

Elm, Ulmus campostris (ūl-mus. Ord. Urticaceae).—Handsome park trees, but by no means suitable for gardens, partly because the roots ramble afar and impoverish the soil, partly because the trees are apt to cast their branches in summer, and partly because of the noxious drip. They should not be planted near drives because of the branch-casting propensity mentioned. The Elms like a friable, loamy soil. They are propagated by seeds and layers, special varieties by grafting. Two good varieties of the common Elm are antarctica aurea and variegata. The Scotch or Wych Elm (Ulmus montana) is suitable for gardens. The Parsley-leaved Elm is a variety of it (crispa), and so are the Golden-leaved Elm, Dampieri aurea, and the Purple-leaved, purpurea.

Embothrium (embōth-rium, from *en*, in, and *bothrion*, a little pit, in reference to the setting of the anthers. Ord. Proteaceae).—A small genus of little importance generally, but including one very fine plant in the species coccineum, a half-hardy evergreen shrub which bears clusters of beautiful scarlet flowers in early summer. It grows out of doors in Cornwall and other mild districts. Peat or loam, but preferably a mixture of both, with grit, should be provided. Propagation is by seeds sown in spring. *See* the *Botanical Magazine*, t. 4856.

Empetrum, Crowberry (ēm-petrum, from *en*, in, and *petros*, a rock, a native of stony places. Ord. Empetraceae).—Evergreen shrubs resembling Heaths, and flowering in May. Berries follow the flowers. Peaty soil in a cool, moist place suits them. Propagation is by cuttings in summer under a hand-light. There is but one species, nigrum, with black berries; scoticum and rubrum are varieties of it; the latter has red berries.

Endive.—*See* Kitchen Garden.

Enkianthus (enkiān-thus, from *enknos*, enlarged, and *anthos*, flower, in reference to the flowers being enlarged in the middle. Ord. Ericaceae).—A small genus of shrubs, which includes one or two useful plants. Loam, with a third of peat and some sand, suits them. Propagation is by cuttings in a frame in spring. Campanulatus, with red flowers in July; and japonicus, with white flowers in late winter, are hardy (*see* the *Botanical Magazine*, t. 7059 and t. 5822).

Epacris (epāc-ris, from *epi*, upon, and *akros*, top, referring to the hilly habitat. Ord. Epacrideae).—Beautiful hard-wooded evergreens, but not easy to grow, owing to the hair-like roots being very susceptible. If kept either too wet or too dry they die. They ought to be grown in a batch to themselves in a greenhouse, and given careful attention in watering. The pots must be well drained (*see* Drainage). Fibrous peat and sand make a suitable compost. Propagation is by young tips inserted in sandy peat under a bell-glass in spring or summer. Prune back after flowering. The following are popular kinds:—

Alba odorata, white, sweet; autumnalis, red and white, October bloomer; devoniana, scarlet.

Epicattleya (epicātt-leya, a compound from Epidendrum and Cattleya, the plants being hybrids between those genera).—*See* Cattleya for culture.

Epidendrum (epidēn-drum, from *epi*, upon, and *dendron*, tree, growing on trees. Ord. Orchidaceae).—Graceful Orchids, requiring hothouse culture, and thriving in pots or pans if set high over a mass of crocks and the roots packed with fibrous peat and Sphagnum moss. Large supplies of water must be given during the growing season, but the supply must be lessened in the autumn, without, however, being stopped altogether. The following are selected from a large number:—

dellense, hybrid, orange, spring; Medusae, purple, early summer; vitellinum majus, orange, late summer; Wallisi, crimson, white, and yellow, sweet, winter.

Epigaea, May-flower (epigāē-a, from *epi*, upon, and *gaia*, earth, in allusion to the trailing habit. Ord. Ericaceae).—E. repens is a trailing evergreen, the principal charm of which is the fragrance of its white flowers, which are produced in summer. It is hardy, but will not grow in dry, sun-scorched soil. A cool, moist, sheltered place should be found, and peat provided. Propagation is by division in spring.

Epilaelia (epilāē-lia).—A hybrid between Epidendrum and Laelia. For culture, *see* Cattleya. Charlesworthii, with scarlet flowers in July, is a good hybrid.

Epilobium, Willow Herb (epilō-bium, from *epi*, upon, and *lobos*, pod, in allusion to the flowers being set on the seed pod. Ord. Onagrarieae).—Tall, hardy herbaceous perennials. Two of the finest species, angustifolium and hirsutum, do well by the waterside. Propagation is by division in spring. There is a white variety of angustifolium. Obcordatum, rose, is a good dwarf species. All thrive in any good soil.

Epimedium, Barrenwort (epimē-dium, from *epimedion*, Pliny's name. Ord. Berberideae).—Useful dwarf perennials for the shady parts of the rockery, attractive both in leaf and flower. Propagation is by division. They like sandy loam, except Alpinum, which should have peat. This species is British, and has red and yellow flowers in May. Macranthum, with blue and white flowers in spring, is good; violaceum is a dark variety of it.

Epiphyllum.—*See* Cactus.

Eragrostis.—*See* Annuals—Grasses.

Eranthemum (erān-themum, from *eraο*, to love, and *anthos*, flower. Ord. Acanthaceae).—Pretty plants for a warm greenhouse, useful in that they bloom in winter. Loam, with a fourth each of peat and leaf mould, and sand, suit. Propagation is by cuttings under a bell-glass in spring. A little pinching is required to insure a bushy habit. Andersoni, with purple and white flowers (*Botanical Magazine*, t. 5771); albiflorum, white (*Bot. Mag.*, t. 4225); and cinnabarinum, scarlet, are useful species. Pulchellum is called Daedalacanthus nervosus by modern botanists. It has blue flowers (see *Bot. Mag.*; t. 1358).

Eranthis hyemalis (Winter Aconite).—*See* Bulbs.

Eremurus (eremū-rus, from *eremos*, solitary, and *oura*, tail, in allusion to the flower spike. Ord. Liliaceae).—Tall, hardy herbaceous plants, with handsome spikes of bloom in summer. Fertile, friable, loamy soil gives the best spikes, and they may rise 6 or 7 ft. high. Propagation is easily effected by seeds sown in a greenhouse in spring, but they will not flower for 3 or 4 years. The roots are remarkable, and as growth starts early they should be planted in autumn. Guard against slugs in spring. A sheltered place should be provided for these noble plants, as they suffer from strong winds. Himalaicus, white, is a fine species. Bungei, yellow, is good. Robustus has silvery-rose flowers, and is very strong; Elwesii is an early variety of this.

Erica, Heath (erī-ca, from *erico*, to break, in allusion to the brittleness. Ord. Ericaceae).—These are amongst the most valuable of evergreens, for in addition to the greenhouse species they give us such beautiful hardy species as arborea, carnea, cinerea, and Mediterranea. The greenhouse species are not easily managed. They are hard wooded plants with hair-like roots, requiring abundance of water in summer, yet liable to suffer from sodden as well as from dry soil. They should be grown in sandy peat, and if repotting is required it should be done towards the end of winter. The old soil should be crumbled from the ball, which should be soaked if dry, and then put into a 6-in. pot and well packed with fresh soil over ample drainage. A greenhouse from which frost is excluded will suit them in winter, when much less water will be needed. They will flower in spring, and may be stood on an ash bed in the open in summer. Propagation is by cuttings in summer, in sandy soil under a bell-glass.

Greenhouse Heaths.

caffra, white, May.
Cavendishiana, yellow, July.
gracilis, purplish-red, March.
hyemalis, rose, winter.
Massoni, red and green, summer.
ventricosa, flesh, late spring (several varieties, such as alba, white; erecta, flesh; and superba, scarlet).

Hardy Heaths.

arborea, white, May, several varieties. "Brier" pipes are made from the wood. The name has no connection with the hedge Brier, but is a corruption of *bruyère*, the French for Heath.
carnea (herbacea), purple, February.
cinerea, crimson, July, many varieties.
lusitanica (codonodes), pink, February.
Mediterranea, purple, spring (*Botanical Magazine*, t. 471), several varieties.
vagans, purplish-red, autumn, Cornish Heather.

Erigeron, Fleabane (erīg-eron, from *er*, spring, and *geron*, old man—downy in spring and hoary later. Ord. Compositae).—For culture, *see* Flower Garden—Herbaceous plants. The most popular species is aurantiacus, which has orange flowers in July, and grows about a foot high; superbus is a fine variety. Speciosus (syn. Stenactis speciosa), *Botanical Magazine*, t. 3606, is a good plant. Alpinus semi-barbatus (syn. Roylei) is well worth growing.

Erinus (erī-nus, from *er*, spring, because of the early blooming. Ord. Scrophularineae).—The only species grown to any extent is alpinus, which bears magenta flowers in May, and is well adapted for the rockery (*see* Flower Garden). It likes well-drained, sandy soil and a warm spot. Propagation is by seed. See *Botanical Magazine*, t. 310. There are white and rose varieties.

Eritrichium (eritrīch-ium, from *erion*, wool, and *thrix*, a hair, on account of the woolly hairs. Ord. Boragineae).—The species nanum is a useful dwarf plant, giving bright blue yellow-eyed flowers in summer. It may be grown on the rockery (*see* Flower Garden), if given a pocket of peat and leaf mould, with plenty of grit. Propagation is by division in spring. See *Botanical Magazine*, t. 5853.

Erodium, Heron's-bill (erō-dium, from *erodios*, a heron, in allusion to the form of the style and ovaries. Ord. Geraniaceae).—Pretty hardy plants, allied to Geraniums, and suitable for border and rockery (*see* Flower Garden). They like a light, friable soil, and may be propagated by seeds in spring. Chamaedryoides (syn. Reichardi), with white, rose-veined flowers in summer; Manescavi, with purple flowers in June; and macradenum, violet, June (*Botanical Magazine*, t. 5665), are all good.

Eryngium, Sea Holly (erȳn-gium, from *eryngeon*, a name adopted by Pliny. Ord. Umbelliferae).—Tall, spreading hardy herbaceous plants, with metallic flowers that, if not beautiful, have quaintness and distinctness. They are not particular as to soil, and are easily propagated by division in spring, or from seeds. The following are the principal kinds: alpinum, blue, 2 ft. (*Botanical Magazine*, t. 922); amethystinum, blue, 2½ ft.; maritimum, blue, 1 ft.; Olivierianum, blue, 2 ft.; and planum, blue, 3 ft. All flower in summer.

Erysimum, Hedge Mustard (erȳs-imum, from *eryo*, to draw, in allusion to the blistering power. Ord. Cruciferae).—*See* Annuals for culture. Perofskiaum, orange, 18 ins. high, July (*Botanical Magazine*, t. 3757), is the principal species. It is a biennial, but generally treated as a hardy annual.

Erythrina, Coral Tree (erythrī-na, from *erythros,* red. Ord. Leguminosae).—The most interesting member of this genus is Cristagalli, which bears racemes of scarlet flowers in summer. Although not perfectly hardy, it will thrive on an outside wall if the position is sunny and sheltered. The station should be prepared by adding loam, peat, and road grit, or manure and sand. It should be mulched with manure in early summer. Propagation is by cuttings, which should be removed with a heel and kept close in bottom heat. *See* the *Botanical Magazine,* t. 2161.

Erythronium, Dog's Tooth Violet (erythrō-nium, from *erythros,* red. Ord. Liliaceae).—*See* Bulbs.

Escallonia (escallō-nia, after Señor Escallon. Ord. Saxifrageae).—This genus includes one very popular plant in macrantha, a beautiful shrub that thrives out of doors in mild districts, and has pink flowers in summer, followed by berries (*see* the *Botanical Magazine,* t. 4473). It is not particular as to soil, and may be propagated by cuttings of firm wood in a frame. There are several varieties, one of the best being sanguinea. Langleyensis, a pink hybrid; and philipiana, white, are also good.

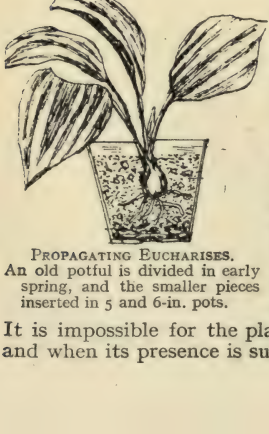
Eschallot.—*See* Kitchen Garden—Shallot.

Eschscholtzia (eschschōlt-zia, after Dr. Eschscholtz. Ord. Papaveraceae).—*See* Annuals.

Espalier.—*See* Fruit.

Eucalyptus (eucalȳp-tus, from *eu,* good, and *kalypto,* covering, in allusion to the calyx covering the flower. Ord. Myrtaceae).—A large genus of trees. Globulus is the popular Blue Gum, so often grown as a pot plant, but suitable for outdoor culture in mild districts. It thrives in peat and loam. Propagation is by seeds, or cuttings in sandy soil in early summer, under a bell-glass. Gunnii is also an interesting species; and citriodora, which has citron-scented leaves, is sometimes grown.

Eucharidium (eucharīd-ium, from *eucharis,* agreeable. Ord. Onagrarieae).—Grandiflorum is a pretty rosy annual, and there are a white and other varieties. For culture, *see* Annuals.



Propagating Eucharises. An old potful is divided in early spring, and the smaller pieces inserted in 5 and 6-in. pots.

Eucharis (ēū-charis, from *eucharis,* agreeable, in this case perhaps referring to the perfume. Ord. Amaryllideae).—One of the most valuable of warm-house plants, on account of the profusion of its large, substantial, pure white flowers, which are good for wreaths, bouquets, and general cut-flower work. It is easy to grow, and the complete failures sometimes seen arise from the attack of a mite which infests the bulbs, multiplies enormously, and renders the plants weak and dingy. It is impossible for the plants to thrive when this pest is at work, and when its presence is suspected the best course is to shake out

the bulbs, wash the soil from them, and soak them for a quarter of an hour in a solution of liver of sulphur (sulphide of potassium), half a pound in 6 gallons of water. Loam, with a fourth of leaf mould and some sand, suits. If potting is required, it should be done after flowering, but frequent shifts are not necessary; with plenty of water while growing, and liquid manure from the time they begin to bloom, they will flower well in 6-in. or 7-in. pots. They should be flowered in a hothouse, and put into a cooler place afterwards. The water-supply may be gradually reduced after blooming in order to rest the plants. Propagation is by offsets, which may be removed when repotting. Grandiflora (syn. amazonica) is the popular species; Moorei and Lowii are forms of it. They are splendid winter bloomers. Candida is sometimes grown; it has white flowers in autumn.

Eucomis (ēū-comis, from *eukomes*, beautiful-haired. Ord. Liliaceae).—The species punctata, a half-hardy bulb, is grown as much for its spotted leaves as its flowers. It will thrive out of doors in mild districts. It may be grown in sandy loam and propagated by offsets. It grows 2 ft. high, and has green and brown flowers in August (*see* the *Botanical Magazine*, t. 913 and 1539).

Eucryphia (eucrȳph-ia, from *eu*, well, and *kryphia*, a cover, in allusion to the calyx. Ord. Rosaceae).—The species pinnatifolia is esteemed for its beautiful white flowers, which are produced in summer. It is an evergreen shrub, and may be grown outdoors in mild districts, but in cold, exposed places must have shelter and protection in winter. It likes a compost of peat and loam. Propagation is by cuttings of young shoots under a bell-glass, or by layers. *See* the *Botanical Magazine*, t. 7067.

Eulalia (eulā-lia, from *eu*, well, and *lalia*, speech—literally, much praised. Ord. Gramineae).—Japonica zebrina is one of our most graceful ornamental Grasses, and a strong clump looks well on the lawn. It is not particular as to soil, and may be increased by division in spring. There are several other varieties of Japonica.

Euonymus, Spindle Tree (euōn-ymus, from *eu*, good, and *onoma*, name—of good repute. Ord. Celastrineae).—These are handsome shrubs, some deciduous, others evergreen, grown for their foliage. The evergreens are good for winter effect, and do well in towns, while they are among the best of seaside plants. They will grow in almost any soil. Propagation is by cuttings of firm wood in autumn. Europaeus is a hardy deciduous shrub, with white flowers in May. There is a variegated variety. Japonica is evergreen, and has several varieties; latifolius aureus is one of the best. Radicans is also evergreen, and has several varieties.

Eupatorium (eupatōr-ium, after Eupator, King of Pontus. Ord. Compositae).—Some of the Eupatoriums are hardy, and will thrive in ordinary well-drained soil, with spring division. Others require pot culture under glass, and like a compost of loam, a third of leaf mould and sand. These should be raised from cuttings and pinched to make them bushy. They should be cut back after flowering.

Hardy Herbaceous Species.

ageratoides, white, August, 4 ft.
altissimum, blush, late summer, 4 ft.
purpurea, purple, August, 4 ft.

Greenhouse Species.

grandiflorum, white, spring, 3 ft.
riparium, white, spring, 3 ft.
Weinmannianum (odoratum), white, autumn and winter, 4 ft.

Euphorbia, Spurge (euphōr-bia, after Euphorbus, a physician. Ord. Euphorbiaceae).—A large and varied genus, including annuals and perennials, hardy and tender, herbaceous and shrubby, all with milky juice. Two or three are grown for the greenhouse, notably fulgens (jacquinaeflora), a brilliant evergreen, growing about 3 ft. high, with scarlet flowers in autumn and winter. It thrives in loam in a hothouse, and is propagated by cuttings. Lathyris is the Caper Spurge, and is hardy.

Eurya (ēū-rya, from *eurys*, large, in allusion to the flowers. Ord. Ternstroemiaceae).—Latifolia variegata is the best of this genus, and is grown for its handsome foliage. It is an evergreen, requiring greenhouse protection. Peat and loam in equal parts suit, with sand. Propagation is by cuttings of mature wood in peaty soil under a bell-glass.

Eutoca (eutō-ca, from *eukotos*, fruitful, in allusion to the seeding. Ord. Hydrophyllaceae).—The species viscida has blue flowers in summer. For culture, *see* Annuals.

Evening Primrose (Oenothera. Ord. Onagrarieae).—The Evening Primroses comprise both hardy annuals and perennials. For the culture of the former, *see* Annuals; of the latter, Flower Garden—Herbaceous plants. *See also* Oenothera.

Evergreens.—Plants which hold their leaves throughout the year. Many are valuable as hardy shrubs, these including Hollies, Aucubas, and Laurels. All the principal kinds are dealt with under their own names (*see also* Flower Garden—Shrubs). In pruning, a knife should be used in preference to shears, in order to avoid cutting the leaves. The cuts should be made near the leaves below, so that bare stumps do not show.

Everlasting Pea (Lathyrus. Ord. Leguminosae). — Beautiful hardy ramblers, suitable for growing against fences and pillars. The typical species is latifolius, now called sylvestris platyphyllus, and has carmine flowers. There is a splendid white variety called White Pearl, which comes true from seed. They enjoy moist, substantial soil.

Everlastings.—The principal "everlasting flowers," such as Helichrysums, Acrocliniums, and Rhodanthes, are dealt with under their own names, or under Annuals.

Exacum (ēx-acum, from *ex*, out of, and *ago*, to drive—credited with expelling poison. Ord. Gentianeae).—Beautiful plants for a warm

greenhouse, flowering in winter. They like a compost of loam, with a quarter each of peat and leaf mould, and sand. The annuals are raised from seed in a warm house or frame in spring; and the perennials from cuttings. Affine has violet flowers, and grows 6 ins. high. Zeylanicum macranthum, violet, autumn, is also grown.

Exochorda (exochōr-da, from *exo*, outside, and *chorde*, a cord, in allusion to the placenta. Ord. Rosaceae).—Grandiflora is a beautiful white-flowered shrub, blooming in May. It is not particular as to soil, but likes a sheltered place. Propagation is by layers in autumn or suckers in spring. See *Botanical Magazine*, t. 4795.

Faba or Vicia (Broad Bean).—*See* Kitchen Garden.

Fagus, Beech (fā-gus, from *phago*, to eat, in allusion to the edible seeds. Ord. Cupuliferae).—The common Beech is F. sylvatica, and there are many varieties of it, such as dark purple, variegated, copper, and pendulous. *See* Beech and Flower Garden.

Fairy Rings.—Circles of fungi are sometimes seen growing in the grass, and every year they get stronger, owing to the rich nitrogenous deposit following the decay of the earlier members. A " fairy ring " in a meadow is interesting and pleasing, but it is out of place in a garden, and may be destroyed by syringing with a pound of sulphate of iron dissolved in 3 gallons of water.

Fallowing.—To " fallow " ground is to dig it and leave it without a crop for a period, in order that the corruptible matter within it may decompose and the ground be aerated. Good gardeners rarely adopt this practice. By proper tillage and manuring they make the ground capable of carrying continuous crops.

False Acacia, Robinia Pseudacacia.

Farfugium.—*See* Senecio.

Farm-yard Manure.—*See* Manure.

Fatsia (fāt-sia, from *fatsi*, the Japanese name. Ord. Araliaceae).—The one plant of importance in this genus is japonica, which is almost universally grown under the name of Aralia Sieboldii, a half-hardy shrub much esteemed as a room plant, thriving in sandy loam, and propagated by cuttings. It will thrive out of doors in sheltered places.

Feather Grass, Stipa pennata.

Fences.—In enclosing ground to form a garden the nature of the dividing line must be carefully considered. A wall is best, because it gives immediate privacy, security from cattle, and shelter, besides affording support for greenhouses, fruit houses, and trees. It is, however, the most expensive. The cost varies, and estimates should be got from local builders. An oak fence 6 ft. high may cost 8*s*. per yard run. Galvanised wire fences are very popular. A fence 4 ft. high will keep back stock. The wires should be a foot apart, and the lower half protected with wire netting, to exclude lambs and rabbits. The top wire at least should be barbed to discourage cattle from putting their heads over; but if there is anything tempting on the other side they will try to get their heads

through below. The posts should be of oak, the lower part tarred, and the upper part tarred or painted as taste dictates. *See also* Hedges.

Fennel.—*See* Kitchen Garden—Herbs.

Ferns.—Almost every lover of plants grows a few ferns, and a considerable number specialise them. The latter class have their own publications. The ordinary species have no particular interest for them. On the other hand, the general amateur could not possibly grow all the varieties, as in the case of some species they number hundreds, but must content himself with a selection of the best kinds. Most of the principal ferns are mentioned under their own names in this work, but a few general observations may obviate repetition with respect to certain cultural points.

Propagation.—The majority of ferns do not flower, and the "seeds" must be looked for in the form of spores on the under surface of the fronds, to which they adhere until they ripen. In



PROPAGATING ASPLENIUMS BY THE PLANTLETS ON THE FRONDS.

The dotted line shows the depth to insert a plantlet detached from Asplenium bulbiferum.



PROPAGATING ASPLENIUMS BY THE LEAF PLANTLETS.

1. Drainage. 2. Rough soil. 3. Fine soil. 4. Space for water. 5. Base of plantlet. 6. Young fronds starting. 7. Old frond on a growing plant pegged down.

sowing, a fine surface of soil is prepared, and the fronds are either laid on when the spores are mature, or held over the pot and rubbed with the fingers to scatter the spores. The pots should be shaded. A plate-like process—the prothallium—on which the male and female organs develop, forms; from these the plants arise. They may be pricked off, potted singly, and repotted as required, the same as ordinary plants. Some kinds of ferns which form a spreading root-stock—the Maidenhair for example—may be propagated by division; the plants may be cut up when growth starts in spring. Some ferns form plantlets on the fronds; the latter can be drawn down to the surface of the soil in another pot, and there fixed in position till the plantlets have rooted freely, when they may be severed.

Soil.—Fern growers no longer pot their plants almost entirely in peat; it is recognised that loam contains more nutriment, and consequently it is used much more largely for ferns than was formerly the case. Half each of fibrous loam and peat, with a quarter of leaf

mould or decayed manure, a heavy dash of sand to insure porosity, and a few bits of charcoal over the drainage, will suit the majority of ferns admirably.

Shade.—Another old idea has been modified. Speaking generally, ferns are certainly shade lovers; but it is found that hardy kinds may be grown in sunny parts of the garden if they have adequate root moisture. Under glass they are liable to suffer from the aridity of an unshaded house unless the grower is at hand to ply his syringe in the hottest part of the day.

Repotting.—It is wise to turn ferns out of their pots every spring, if only to rearrange the drainage, but it will be found wise to go farther, as a rule, and remove the old soil from the side and base of the ball without disentangling the roots, afterwards replacing in the pot and ramming in fresh soil.

Ferns in rooms.—As a rule ferns soon fail in rooms, because the air is too dry; but with care and judgment they may be kept healthy a long time. The principal point is watering. If the soil goes dry for some time the plants are sure to suffer; on the other hand, a sodden state is bad. The only way of keeping things right is to test the pots every day in summer (*see* Watering) and be guided by the sound. In winter water may not be wanted more than once a week. Another important matter is to insure ventilation without cold draughts. An open window and a closed door generally permit of the happy medium being struck; with both open together the plants may be injured.

Ferns in baskets.—Some ferns look their best in baskets. Wire receptacles may be used. They should be lined with moss to keep the soil in, and a compost similar to that for pots used. In summer the baskets may be dipped daily in a tub of water.

Indoor ferneries.—In large places it may be possible to devote a house to ferns, and if so it should be done thoroughly, covering the walls, providing rocks and water and shading the roof. A simple way of covering the walls is to fix wire frames a few inches from the wall, pack with compost, and plant. The ferns should not be grown in pots, but planted among blocks of tufa.

Outdoor ferneries.—A fernery is a good adjunct to a rock garden, and stones should be used in preference to tree roots, which rot down quickly. The situation should not be heavily shaded. Christmas Roses and various hardy bulbs may be planted between the ferns to flower in winter and spring.

Filmy ferns.—The Todeas, Hymenophyllums, and Trichomanes should be kept separate in a case or cave where the shade is dense and the atmosphere saturated.

Fern phrases.—Ferns are cryptogams (which see). The creeping stems of some species are called rhizomes. The leaves are called fronds, and the stalks stipes. The first divisions of divided forms are called pinnae, and the subdivisions pinnules. The seeds are called spores, and the case covering the latter is the indusium. The clusters of sporangia are called sori. The female organs are called archegonia, and the male antheridia. Both form on the membranous plate (prothallium), which is the first growth from the spore.

Good Room Ferns.	*Good Basket Ferns.*
Adiantum cuneatum (Maidenhair)	Adiantum Edgworthii
Asplenium bulbiferum	Asplenium flaccidum
Nephrodium molle	Davallia Mooreana
Pteris cretica cristata	Gymnogramme schizophylla
,, serrulata	Microlepia (Davallia) hirta cristata
,, tremula	Nephrolepis davallioides furcans

Fertilisation.—*See* Hybridisation.

Feverfew.—The Pyrethrum section of Chrysanthemums are called Feverfews, and the name is perhaps most commonly applied to Pyrethrum aureum (Chrysanthemum Parthenium), the Golden Feather. *See* Chrysanthemum and Flower Garden.

Ficus, Fig (fī-cus, from *fag*, the Hebrew name. Ord. Urticaceae). —This genus includes such widely different plants as the India-rubber plant (F. elastica) of our gardens and the delicious Fig (F. Carica; *see* Fruit). The India-rubber plant is popular for rooms, and may be kept healthy in a compost of peat and loam in equal parts, with sand, if carefully watered (*see* Watering), ventilated without cold draughts, and the leaves sponged weekly. It may be propagated by pieces of stem with a leaf attached in a propagating case. F. pumila (syns. repens and stipulata) is a graceful green-leaved creeper suitable for a greenhouse wall.

Fig.—*See* Ficus and Fruit.

Filbert.—*See* Corylus and Fruit.

Finger-and-toe.—*See* Kitchen Garden—Green Vegetables.

Fir.—The general name "fir" (from the Anglo-Saxon *furh*) is applied to a considerable number of resinous, cone-bearing trees. Thus Pseudotsuga (or Abies) Douglasi is often called the Douglas Fir, Abies pectinata the Silver Fir, and Pinus sylvestris the Scotch Fir. Particulars of the different kinds of fir are given under their own names.

Flame Flower.—*See* Kniphofia.

Flax.—*See* Linum.

Flower Garden.—A well-arranged, well-managed flower garden is a source of immense pleasure and enjoyment. It is beneficial physically and morally. The cultivation of beautiful flowers is at once a pleasant pastime and an ennobling pursuit. In years gone by very narrow ideas of flower gardening were displayed: the plants grown were of a few kinds, tender in constitution and garish in bloom. Nowadays much greater breadth and freedom prevail. Hardy plants of many kinds are used, the garden is more varied and more interesting. With abundance of flowers all round the house, a cool stretch of grass, belts of shrubs, a rockery, water, and a judicious admixture of trees, the home surroundings are made beautiful and fragrant. The principal features of the flower garden may be taken *seriatim*.

Herbaceous borders.—The most important feature of modern

flower gardens is its herbaceous borders. They should be spacious —within the limits of the place—varied and planted with sterling things. It is easy to mismanage herbaceous borders, and then they are as uninteresting as ever a bedded-out garden was. On the other hand, it is not difficult to deal with them in such a way as to have them full of growth and bloom throughout the outdoor season. The borders should be wide, especially if they have to accommodate trees and shrubs; and even without them there should be no stint of ground. The borders may, indeed, range from 6 to 20 ft. in width. The word " border " suggests a background, and wherever belts of trees and shrubs are being planted, it is wise to leave a belt 6 ft. wide at the front in which to put herbaceous plants. *Soil :* The ground should be prepared as thoroughly for herbaceous plants as for vegetables, and the method of cultivation and manuring may be the same (*see* under Kitchen Garden). With this deep tillage and liberal manuring the plants will make vigorous growth and bloom long and abundantly. *Division and planting :* Old herbaceous plants may be divided, and new ones planted, from November to April inclusive. Spring planting is quite good, and suits the majority of people as well as the majority of plants. But those who are forming a new garden, and propose to carry on a kitchen garden as well as a flower garden, will find a great rush of work in spring, and may be advised to plant their herbaceous borders in autumn if they have leisure during daylight. There is one disadvantage of autumn division in the case of existing borders, and that is that any bulbs which may have been planted in a previous year are out of sight. They are not dormant, because the roots are moving, but the stems have not pushed through the soil. A careless workman might do much damage to the clumps of bulbs, but if he is taught to look after them, and when he dislodges part of a clump to lift it, dig the soil, scatter in some fresh sandy loam, remove the small offsets and replant, he really does good rather than harm. The clumps of herbaceous plants may be dealt with at the same time. First the disfiguring dead shoots may be cut away, taking care to shorten well back so as to avoid leaving long, ugly stumps, then the old clumps may be vigorously cut through and the portions replanted after digging the ground and manuring it if necessary. The opportunity may be taken of scattering ashes or coarse grit round the clumps of any kinds which are of doubtful hardiness. *Colour grouping :* Much is heard of colour grouping in borders—that is, of forming small colonies of the different plants, the colours of which shall blend, instead of dotting single plants indiscriminately. There is much in favour of the system, but to carry it out thoroughly throughout the gardening year demands a reserve garden, where a few good plants can be grown while they are out of bloom, and whence they can be shifted when their flowering period approaches, and when the permanent occupants of the borders go off. As examples the following plants may be mentioned:—

Antirrhinums (Snapdragons), sown under glass in January, pricked out in boxes, hardened in a cool place, and planted in June.

Asters, Annual, sown in boxes in spring, and planted out in early summer.

FLOWER GARDEN—*continued.*

Begonias, the tubers started in boxes in spring and kept there till planting time comes.
Chrysanthemums, struck from cuttings in spring, planted in June, and shifted when they show bloom.
Marigolds, treated like Asters.
Nicotianas (Tobaccos), treated like Asters.
Pentstemons, treated like Antirrhinums.
Phloxes, Annual, treated like Asters.
Salpiglossis, treated like Asters.
Sweet Williams, sown the previous June and planted out in summer.
Verbenas, sown in boxes in a warm house in February, hardened, and planted out in June.

It may be readily supposed that if a fairly large group goes out of bloom in late summer or early autumn, and there is nothing to take its place, a bare, and even ugly, spot is left. This is a weakness of colour grouping which is not always recognised and provided for. A spare bed of hardy Chrysanthemums is particularly useful, as the plants not only move well in showery weather, but are very beautiful (*see* Chrysanthemums). When the grouping system is adopted a limited number of kinds is generally dealt with, of which the following are the principal:—

Asters, Perennial (Michaelmas Daisies or Starworts), beautiful for blooming from September to November, easily propagated by division, and will thrive in any soil.
Carnations, lovely and fragrant flowers, propagated by layers in summer.
Christmas Roses, charming autumn and winter bloomers, best planted out and propagated by division in September.
Columbines (Aquilegias), easily raised from seed outdoors in June.
Crocuses, bulbs bought and planted near the front in October.
Daffodils and *Narcissi*, best planted in early autumn.
Delphiniums (perennial Larkspurs), tall and stately plants with spikes of blue flowers, may be raised from seed in summer and further propagated by division in spring.
Gladioli, noble late-blooming flowers, raised by planting corms outdoors in April.
Hollyhocks, handsome old favourites, best raised from seed in June like Columbines.
Irises, exquisitely coloured flowers of which bulbs and tubers may be planted in autumn.
Lilies, pure and refined, may be planted as bulbs in autumn or spring.
Paeonies, large, brilliant, fragrant flowers, propagated in nurseries by grafting.
Pansies and *Violas*, lovely low-growing favourites, propagated by cuttings in autumn.
Phloxes, grand plants with large heads of beautiful perfumed flowers, propagated by cuttings or division in spring.
Pyrethrums, valuable for their bright colours, profusion of bloom, and early starting.

Sweet Peas, charming in clumps, and easily raised from seed outdoors.
Tulips, make glowing masses of colour in spring from bulbs planted in autumn.
Wallflowers, sweet and cheerful old flowers, raised from seed sown outdoors in June.

The foregoing are, however, only a few of the many kinds of plants which may be used in herbaceous borders, and the following tables, giving the principal points about the best herbaceous plants, may be useful; very dwarf kinds are omitted, as more suitable for the rockery:—

Herbaceous Plants not exceeding 2 ft. high.

Kind.	Colour.	Flowering Season.
Achillea, The Pearl	white	summer
Anemone Pulsatilla	violet	spring
Antirrhinums	various	summer and autumn
Anthericums	white	summer
Aquilegia (Columbine)	various	late spring
Armeria cephalotes	pink	late spring
Aster Alpinus	purple	autumn
,, Amellus	purple	late summer
,, dumosus	mauve	autumn
Campanula carpathica	blue	summer
,, muralis	blue	summer
Centaurea montana	blue	summer
Corydalis nobilis	yellow	summer
Delphinium nudicaule	red	summer
Dielytra spectabilis	pink	summer
,, formosa	red	summer
Dodecatheon (American Cowslip)	various	spring
Doronicum austriacum	yellow	spring
Erigeron speciosus	violet	summer
Funkia grandiflora	white	summer
Gentiana Andrewsi	blue	early summer
Geranium Endressi	pink	summer
,, Lancastriense	lilac	summer
,, sanguineum	red	summer
Geum coccineum	red	summer
Gillenia trifoliata	pink	summer
Hemerocallis	orange	summer
Lobelia cardinalis	red	summer
,, fulgens	red	summer
Lychnis Viscaria fl. pl.	pink	summer
Meconopsis Cambrica (Welsh Poppy)	yellow	summer
Monarda didyma (Bergamot)	red	summer
Morina longifolia	purple	summer
Orobus aurantius	yellow	early summer
Papaver nudicaule (Iceland Poppy)	yellow	summer
Plumbago Larpentae	violet	summer
Polemonium Richardsoni	blue	summer

FLOWER GARDEN, HERBACEOUS PLANTS—*continued.*

KIND.	COLOUR.	FLOWERING SEASON.
Primula Japonica	rose	spring
Ranunculus aconitifolius	white	summer
Saxifraga granulata	white	summer
Senecio pulcher	rosy purple	summer
Spiraea palmata	red	summer
Tradescantia virginica	blue	summer
Trillium grandiflorum	white	spring
Triteleia grandiflora	lilac	spring
Veronica longifolia subsessilis	blue	summer

From 2 to 4 ft. high.

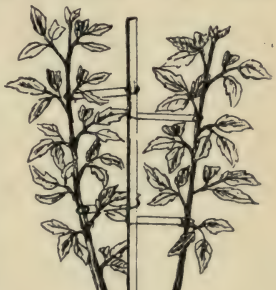
Achillea eupatorium	yellow	summer
,, millifolium roseum	rose	summer
Aconitum (Monkshood)	blue	summer
Anemone Japonica and varieties	rose, white, etc.	late summer
Aster Novi-Belgii, varieties	blue, mauve, lilac, etc.	autumn
,, ericoides	white	autumn
,, diffusus horizontalis	rosy lilac	autumn
Campanula persicifolia alba plena	white	summer
,, Trachelium	blue	summer
Centranthus ruber (Valerian)	red	summer
Chrysanthemums	various	autumn
Echinops ritro	lilac	summer
Geranium pratense	blue	summer
Geum rivale	red	summer
Hemerocallis (Day Lily)	orange	summer
Iris Germanica	various	summer
Lilium candidum	white	summer
,, chalcedonicum	red	summer
,, martagon	red	summer
Lychnis coronaria	red	summer
,, Vespertina flore pleno	white	late spring
Paeony	various	summer
Pentstemon	various	late summer and autumn
Phlox	various	summer
Pyrethrum	various	spring
Rudbeckia grandiflora	purple and yellow	summer
Spiraea arguta	white	summer
,, filipendula	cream	summer
Tulips, late varieties	various	May
Yucca angustifolia	cream	summer

Upwards of 4 ft. high.

Aster Novi-angliae	various	autumn
Delphinium	mostly blue	summer

Kind.	Colour.	Flowering Season.
Epilobium angustifolium	red	summer
Eremurus himalaicus	white	summer
,, robustus	pink	summer
Gynerium (Pampas Grass)	white	autumn
Helianthus (Sunflower)	yellow	late summer and autumn
Lilium auratum	yellow, spotted	summer
,, giganteum	white	summer
Polygonum (Knotweed)	white, yellow	summer
Rudbeckia maxima	yellow	summer
Solidago (Golden Rod)	yellow	late summer

In addition to the natural species, there are numerous garden varieties of the best plants. *Propagation :* The majority of the herbaceous plants are best propagated by division when the borders are gone through, as they should be every year. In dividing them, it should be remembered that the outside parts are generally stronger than the central portions. Many good herbaceous plants may, however, be raised from seed, and with a little forethought a valuable stock of plants can be provided. A simple way of dealing with them is to sow the seed in drills outdoors in June, with Wallflowers and other biennials, thin the rows, and set the plants in a spare bed in July, drawing from this nursery when planting time comes. Those which are not forward enough to transplant the first year may be left till the second. Michaelmas Daisies, Phloxes, Snapdragons, and Pentstemons may be raised from cuttings, the two first in spring, rooted in sandy soil in a frame, and then planted out, the others in autumn in a cool frame. *Staking :* The object of good culture—to get large, vigorous, freely-bloomed plants—is frustrated unless timely and adequate staking is done. It is no exaggeration to say that the beauty of an herbaceous border is doubled from mid-July onward by good staking. Loose, floppy plants are made compact, fresh growth is encouraged, and with new shoots comes another crop of flowers. Ordinary flower sticks and bamboo canes are of little use; strong square stakes 4 to 6 ft. long, according to the plant, are required. These can be bought from florists, painted green, and with the base pointed and tarred; but the rough material can be bought in winter, planed, painted, pointed, and tarred. This is a suitable job for hands in wet weather. There should be two bands, one about a third and the other about two-thirds the height of the clump.



How to stake Plants.
Note that the shoots are looped to the stake, not bunched.

Cocoa-nut string is suitable. Or the shoots may be looped.

Bedding-out.—In these days "bedding-out" does not mean quite the same as it did in years gone by. A much greater variety of plants is used, and more consideration is given to the provision of beautiful combinations. Once upon a time "bedding-out" consisted in little more than putting out so many thousands of Zonal Geraniums. These plants were as much prized for their foliage as their flowers, and a new variety with richly-coloured leaves was very valuable. They were by no means without beauty, and the bright old Geranium has much to recommend it, but it must not be used to the exclusion of everything else. A group of flower-beds on a lawn is still a feature of many large gardens; and it may be made attractive most of the year by arranging two plantings: one in autumn, the other in spring. At the former, bulbs and Wallflowers may be used largely, but as with the former alone the ground would be bare until growth began at the end of winter, and bare earth is not liked in these days, Arabises, Aubrietias, Forget-me-nots, mossy Saxifrages, and other dwarf carpeting plants are used with them. The three first-named are easily raised from seed outdoors in early summer; the last may be propagated by division. Daffodils, or Daffodils and Hyacinths in mixture, may be used in some of the beds; but Tulips give a richer glow of colour, and these noble flowers enjoy high favour. The early Dutch varieties bloom with the other bulbs, and are of low stature; the Cottage and Darwin Tulips flower in May, and are tall growers with immense flowers. They are in full bloom with the Wallflowers, and may be cleared out of the beds at the end of May together; the Tulips to be "laid in" somewhere in the reserve plot, the Wallflowers to the rubbish heap. Another plan for part of the spring bedding is to raise a stock of coloured Primroses, Auriculas. Polyanthuses, and Oxlips from seed in summer, and plant them out a foot apart in beds in autumn. They are at their best with the Wallflowers and May Tulips, and may be planted out with the latter in the reserve garden. When the spring flowers are over, the turn of the summer and autumn flowers comes. A good stock of these should be prepared beforehand: Geraniums from cuttings struck the previous autumn and wintered in boxes in a cool house; Calceolarias, Pansies, Violas, and Pentstemons from cuttings struck in autumn; Verbenas, Snapdragons, Pentstemons, and Indian Pinks from seed sown in a warm house in January, and hardened in a cool house or frame; China Asters, Mimuluses, Ten-week Stocks, Phlox Drummondii, Marigolds, Salpiglossis, and Nicotianas (Tobacco) from seed sown under glass in March; tuberous Begonias from tubers started in boxes in a greenhouse or frame in March; Sweet Peas from seed sown in pots or boxes in early spring; and Carnations raised from layers in summer. With a nice variety of plants such as this much more beautiful and diversified beds can be made than with the old combination of Geranium, Calceolaria, and Lobelia alone. There is room for the display of much taste and originality in bedding with this class of material, and it is free from the objections urged against the old

style of "bedding-out." At each change the beds should be well dug and manured, but in preference to using a heavy dressing of dung apply a light coat and supplement it with superphosphate or bone flour at the rate of 4 oz. per square yard.

Carpet bedding.—This is the most formal of all systems, because the plants used are low growers with coloured leaves, arranged in bands and panels, and restricted by regular cropping with finger and thumb throughout the summer. It enjoys no favour, and may be considered obsolete, although used occasionally in the public parks to stimulate the curiosity of the cruder elements of the community.

Trees.—What are known as park or forest trees are not wanted in the flower garden, because they deprive plants of sun and food. But room should be found for one or two ornamental trees, notably Copper Beech, Variegated Maple (Acer Negundo variegata), Tree of Heaven (Ailanthus glandulosus), crimson and white Thorns, Laburnum, Tulip Tree (Liriodendon), Magnolia, Purple-leaved Plum, Robinia, Almond, and Lilac. The foregoing are leaf-losers. Amongst evergreens, Holly, Arbutus, and Portugal Laurel may be considered. It is rare to see any of these approaching the dimensions of the park trees, unless it be the Copper Beech; but all have beautiful flowers or foliage to recommend them. The evergreen cone-bearing trees (Conifers) are excellent for the flower garden, because of their compact growth, graceful form, and handsome leafage. The Cedar (Cedrus), Juniper, Cypress (Cupressus), Pines and Firs (Abies, Picea, and Pinus), Monkey Puzzle, Larch (Larix), Wellingtonia, Yew (Taxus), Maidenhair Tree (Ginkgo), and Thuya are familiar examples. Conifers should not be set amongst shrubs, but given isolated positions. Standard Thorns, Laburnums, Purple-leaved Plum, Rowan or Mountain Ash, False Acacia, and Almond may, however, be planted abundantly in shrubberies to break up the uniformity. In this connection, too, the fruit genera may be considered. Pyrus floribunda is a beautiful tree, and so is the Bird Cherry. If a large, fast-growing tree is wanted for a boundary, the Poplar might be considered; if the heads are pruned to about half the length of the branches for two successive years they soon make a screen.

Here are the names of some handsome evergreens for good positions:—

Andromeda floribunda
Arbutus Unedo
Azalea
Berberis
Ceanothus
Choisya ternata
Cistus
Coronilla glauca
Daboëcia
Daphne
Erica (Heath)
Kalmia latifolia
Lavender
Magnolia
Olearia Haastii
Pernettya mucronata
Rhododendron
Yucca

FLOWER GARDEN—*continued.*

The following are beautiful flowering shrubs:—

Abelia floribunda	Forsythia
Amelanchier botryapium	Genista
Azalea	Hydrangea
Berberis	Hypericum
Buddleia	Kerria
Ceanothus	Magnolia
Chimonanthus fragrans	Philadelphus
Cotoneaster microphylla	Rhododendron
Cydonia Japonica	Ribes
Cytisus	Rose
Daphne	Rubus
Deutzia	Spiraea
Diervilla (Weigela)	Viburnum

Referring individually to a few of the most important of the foregoing:—

Aucubas will grow either in sun or shade, and most soils come alike to them. As they are naturally compact in habit they do not need much pruning. If both male and female forms are planted in the garden there will be abundance of berries.

The *Evergreen Box* (Buxus sempervirens) grows in a close, dense mass, and will thrive in most soils.

The *Brooms* are perhaps the best of all shrubs for light, sandy soil. They have a close pyramidal habit. Genista Andreana has beautiful brown and yellow flowers.

Euonymuses have handsome foliage, and there are variegated forms available. They thrive near the sea.

Hollies are admired both for their foliage and berries. The Silver Milkmaid is a beautiful sort. They grow slowly.

The *St. John's Worts* have ample foliage and bright yellow flowers. They will thrive in shade. Calycinum is one of the best.

Veronicas will grow in the poorest of soil. They form neat bushes and need no attention. Traversi is a good species.

Azaleas are the most brilliant of shrubs. The hybrids of Azalea Mollis, such as Anthony Koster, are splendid plants, and the shades they give—orange, salmon, and cream—are not common among shrubs.

Berberises are valuable plants, because they will grow in most kinds of soil, and in addition to having handsome evergreen foliage they bear long streamers of brilliant orange or yellow flowers. Darwinii and stenophylla are two of the best.

Ceanothuses like the shelter of a wall, and produce large, Lilac-like heads of bloom, of a soft lavender tint, often quite into November. They will thrive in most kinds of soil.

Daboëcias are lovely little shrubs, not half enough known, but eagerly bought and planted by those who see them. They form neat, compact little bushes, which become covered with charming flowers in summer. They thrive both on loamy and peaty soils. Polifolia and alba are both desirable.

Daphnes are desirable if only for their fragrance. They make small, neat bushes, and the Mezereon is covered with fragrant reddish flowers before the leaves appear.

Heaths (Ericas) are well-known inhabitants of peaty uplands, and such species as carnea, mediterranea, and lusitanica are worth growing in the garden.

Deutzias are abundant bloomers, and bear long sprays of white flowers. Crenata flore pleno is a grand variety.

Diervillas (Weigelas) are lovely shrubs, which clothe themselves with flowers from top to bottom. Rosea, alba, and Eva Rathké are all good. They thrive in most soils.

Forsythias bloom early and profusely, often being covered with yellow flowers in March, before the leaves appear. Suspensa is one of the best species.

The best *Hydrangea* is paniculata grandiflora, which produces immense heads of white bloom. It likes shelter.

The double *Kerria* is best against a low wall, or in a sheltered angle. Here it is completely clothed in small deep yellow rosettes.

Lavender will thrive in most soils, and needs hardly any culture. The perfume of the flower is too well known to need description.

Magnolias are glorious shrubs, and will thrive out of doors if put in sheltered places. Stellata and conspicua are particularly good. The former blooms in April before its leaves appear. Grandiflora is best against a wall.

Philadelphus or *Mock Orange* is not remarkable for handsome foliage or graceful form, but it is well worth growing for the perfume of the flowers.

Rhododendrons are the most beautiful of all flowering shrubs. They have every merit except that of adapting themselves to all kinds of soil. They love peat and loam, but they do not care for sand, and they detest limestone. John Waterer, The Queen, Pink Pearl, Michael Waterer, Memoir, and Old Port are six good varieties of different colours.

Ribes or *Flowering Currant* is a very useful shrub, on account of its early and abundant blooming. It is always one of the first to come into flower, and it covers itself with blossom. Sanguineum, album, and atrosanguineum are three of the best. The Flowering Currants will thrive in almost any soil. The whole plant has a strong but not disagreeable smell.

Roses are generally grown to themselves, but one or two species are good for shrubberies, notably the large-leaved, single-flowered, bushy Japanese Rose. This has large flowers and hips. Alba is a good white variety. Fellenberg and The Dawson are also good shrubbery Roses on account of their bushy habit and profuse blooming. *See also* Roses.

The *Rubus* is a fruit-bearing genus, and generally restricted to the fruit garden, but the species deliciosus is well worthy of a place in the shrubbery, because of the beauty of its large white flowers.

Spiraeas are a host in themselves, for they will thrive in almost any soil provided they have shelter, and they bloom abundantly.

FLOWER GARDEN, SHRUBS—*continued.*

Arguta is one of the best species, because it has graceful foliage as well as charming flowers.

The best-known *Viburnum* is the Guelder Rose, Opulus sterile, with its snowball-like flower heads, but a far finer plant for the shrubbery is plicatum, which forms a bush of handsome habit and bears a profusion of large white flowers. It likes a peaty or loamy soil.

Soil for shrubs.—The phrase frequently used that such-and-such shrubs "are not particular as to soil" should not encourage people to plant them in poor, shallow, ill-cultivated ground. The soil should be broken up to a good depth (*see* Bastard trenching under Kitchen Garden) and well manured. Moreover, an occasional soaking of water or liquid manure will be a great help in a dry summer. Plant early in November, and press the soil firmly.

Pruning shrubs.—When evergreen shrubs have to be pruned in order to keep them within bounds or to restrict them to a certain shape, it should be done with a knife in such a way that the stumps are hidden by the leaves. Those leaf-losing flowering shrubs which bloom on the wood made the previous year (and they are the great majority) should be pruned when they go out of flower, and the wood which has bloomed should be cut out. The new shoots made will flower the following year.

Grass.—Whether for paths, tennis lawns, flower gardens, or shrubbery borders, the grass is a most important consideration. Simple as it is, it will be found to need special and skilled attention if it is to be kept in good order and of a smart appearance. There is an impression that because grass grows in every meadow it needs no management. Well, the meadow grass would soon lose its beauty if it were not manured and grazed. A person who is making a garden out of a meadow will be disposed to work on the plan of cutting up only as much turf as is required for beds, borders, and shrubberies, leaving the rest for lawns. That is all right provided (1) the grass has been well managed by the farmer, and is not full of plantain, dock, thistle, buttercup and daisy; (2) the gardener is prepared to mow, roll, and clip the edges regularly. Meadow turf can be made into good garden turf by mowing it weekly from April to October while dry, rolling it when wet, spudding out weeds or dressing them with sulphuric acid (which must be kept off grass and clothing), trimming the edges of the paths with a pair of long-handled edging shears, and every 2 or 3 years spreading on a mixture of fine soil and dry, crumbly manure an inch thick in autumn, letting it lie till spring. Then sprinkle on the following mixture: nitrate of soda 1 part, bone meal 4 parts; use 5 lb. per square rod. In forming grass it is best to use seed unless one is absolutely sure of being able to buy turves free from weeds; given the latter, however, turves are to be preferred, as by laying them evenly and closely on a firm bed of soil in winter and beating them thoroughly, a lawn fit for anything can be had in a few weeks. It must be remembered that seeding does not necessarily give a weed-free lawn, and the gardener must shun cheap seed from obscure sources, because it is likely to contain as many weed seeds as grass seeds. Buy from one

of the large firms that specialise grass seeds, even if the price is rather high, because these dealers select and clean their seeds with great care. And the soil must be well prepared. It is a good thing to do the work in September, digging, manuring, crumbling, and treading the soil, thus making it quite fine, and sowing half a pound to the square rod. Ask the seedsman to add a little clover to the mixture (he will know how much to put), and mix the whole well up before sowing. Cover lightly with fine, sifted soil, and put black threads or some other protection over it to keep off birds. If the work cannot be done in September do it in April. The lawn is likely to be good or bad according to the thoroughness with which the soil is prepared. Tennis and croquet lawns are playable from turf the same season, but not always from seed. There ought to be a good, thick, springy mat of turf before tennis begins; otherwise the ground is soon worn bare. It is desirable to get a perfectly firm piece of ground for turf at all times, and particularly so for tennis, otherwise it will soon fall into hollows. A full-sized tennis lawn is 78 ft. long and 36 ft. wide, but it is well to allow extra space when making a lawn for this purpose.

Special features.—The flower garden should be as varied as possible, so that there is no bareness, deadness, heaviness, and formality about it. Consequently when the main things, such as shrubberies, herbaceous borders, lawns, and flower-beds, have been provided for, the owner should consider a few special features. Here are a few suggestions for such: a Rose garden, an Iris garden, a Sweet Pea garden, a summer-house, a set of arches, a scented garden, a pergola, a rockery garden, a water garden. If the place is quite small it may not be possible to get all of them in, in which case a selection should be made.

Summer-houses and garden-rooms.—In this age of gardening we are not left without practical help from horticultural builders and makers of rustic-work in adding a pleasant outdoor room to our flower gardens. They show us structures of the most tempting description, bright, airy, and alluringly decorated with flowers. It is certainly a " short cut " to the possession of a suitable structure to make a deal with some special tradesman, whose wares are offered in the country and gardening papers. The summer-house may be a simple erection of " rustic " woodwork, with a boarded floor and a weather-boarded roof, costing from £10 to £20; or it may be an ornate building, painted and glazed, costing from £30 to £50. But a handy amateur will often put up his own summer-house, building it of timber which he has bought of the nearest forester. The building is not likely to cost less than £5 even then, if it is of fair size and is built to last; and that modest sum will be exceeded by more or less according to the amount of material put in. Split larch, the rounded side outward, looks very well, but will not keep out wet quite so thoroughly as weather-boarding. The latter need not be condemned on the score of plainness, as it will be covered speedily if good plants are put into fertile soil and trained on the house. Roses Dorothy Perkins, Carmine Pillar, and Alister Stella Gray; Clematis Jackmanii and C. montana, are well suited for covering summer-houses.

FLOWER GARDEN—*continued.*

Arches.—Creeper-clad arches afford a ready and inexpensive means of breaking up garden stiffness, and should be introduced wherever there is a legitimate place, such as the junction of paths, divisions between departments of the gardens, ends of lawns, and so on. Those to whom the metal arches of the ironmonger are a convenience need not hesitate to use them, but arches of rustic wood are more suitable. Both kinds can be bought ready made at prices ranging from a few shillings upwards. But the country gardener will perhaps make his own. He may be advised to display liberality in the size and treatment of his principal uprights, not only selecting stout pieces, but dressing them well with tar or creosote, and embedding them the better part of 3 ft. deep. The Roses named above, also Crimson Rambler, Philadelphia Rambler, Blush Rambler, American Pillar, Electra, Alberic Barbier, Mrs. F. W. Flight, and many others are suitable for arches. Any of the hardy Clematises may be used. Honeysuckles may be planted, and most of the plants mentioned under Pergolas below may be used.

Pergolas.—A pergola might be described as a string of connected arches, and it is suitable for forming a cool alley or spanning a long walk. The drawback is the amount of material required, the main advantage is the scope provided for a good collection of plants. In addition to Roses, Clematises, and Honeysuckles, less familiar creepers in the Passion Flower (in mild, sheltered places), the Eccremocarpus, Cobaea scandens, Akebia quinata, Jasmine, Canary Creeper, Maurandia scandens, Periploca graeca, and Tropaeolums may be planted on pergolas.

The Scented Garden is a charming corner. Here may be brought together Lavender, Southernwood, Bergamot (highly perfumed when the hand is drawn across the leaves), Sweet Peas, Clove Carnations, Night-scented Stock, Wallflowers, Ambrosia mexicana, Sweet Rocket, Sweet Scabious, Daphne, Lily of the Valley, Heliotrope, Jasmine, Mignonette, Sweet Sultans, Roses, Mock Orange (Philadelphus), Winter Heliotrope (Tussilago), and many other sweet flowers.

The Rockery.—To lovers of Alpine flowers the rockery is the most interesting and important feature of the flower garden—in fact, with many it *is* the flower garden. Not for them the garish joys of bedding, or even the opulent splendour of herbaceous borders. Gardening must be natural, or they find no pleasure in it. Such flower lovers delight in making a garden from the wild and storing it with the beautiful things which they have seen in their travels. There are many districts in which the ground, on being broken up, reveals stone. The rock lies in even strata. No building up of artificial rockwork is needed in such places. Natural rockeries lie ready to hand. In other places there is no stone—at all events near the surface—and the lover of Alpines finds himself constrained to construct rockeries for his favourites. A problem is thereby created—a problem which requires good judgment in the solving. Stone has to be bought and put into position, and there are few tasks in the flower garden more easily spoiled. *Building rockwork :*

It is almost impossible to describe the best plan of building rockwork, as a good deal depends on the configuration of the ground and the nature of the stone; but a few hints may be of service to beginners. (1) A sunny position should be chosen, as Alpine plants are accustomed to unrestricted light. (2) If the ground is variable in contour its outline may be utilised to form natural mounds and dells; if level, the outline may be broken by forming mounds with the larger stones. (3) The rock garden should not run in a straight line, but should advance and recede, so that bay succeeds promontory. (4) The body of the rockery should consist of soil rather than of stones, because the plants will not thrive under the conditions which they have to face unless they have abundance of good soil for rooting in. (5) The rock garden looks well if formed in irregular masses on both sides of a winding path, which should itself consist of stones, large, flat pieces being chosen, and dwarf plants put in crevices between them. (6) Given such a path, the rockery might be carried up on either side of it in low, flat terraces, each 3 or 4 ft. wide, and rising above the one below it at a height of about a foot. This style of rockery building has several advantages: (*a*) small stones may be used, (*b*) if a mistake is made it can be rectified without the laborious shifting of large masses of rock. (7) An effect of height can be got in a small compass so long as everything is kept in proper proportions. Any trees and shrubs which are used on a small rockery must be small themselves, or the proportion will be lost. (8) When stones, whether large or small, are put in a sloping mound or bank of soil, care should be taken to set them in such a way that the rain and water supplies may fall inwards instead of outwards—in other words, the stones should deflect the moisture towards the plants, not away from them. *Soil for rock plants :* In making up the body of a rock garden with soil it is generally convenient to draw from soil in the neighbourhood, but while this may be good enough to form the nucleus it may not be suitable for actual contact with the plants, either on account of its being heavy and damp, or because it is very poor and fibreless. The difficulty can be got over by importing a few loads of special soil for surfacing, and especially for the " pockets " among the stones in which the plants are placed. Here a mixture of good fibrous loam and limestone grit will be very helpful. The great majority of Alpines love a ring of chippings around them. *Planting Alpines :* The rockery maker should have before him the desirability of



Plants beside Rock Steps.



Good arrangement of Stones for a Rockery. Rain can fall in between the stones.

getting the stones well covered as quickly as possible, and to this end should plant carpeters freely. Places may be provided for broad patches of these. But it is well to guard against their encroaching on the pockets of weaker things and smothering the latter. Arabises, Aubrietias, Cerastiums, Alyssum saxatile, Iberises (perennial Candytufts), and many of the Saxifrages are beautiful plants, and very useful for covering the surface of the soil quickly; but they must be kept within bounds. Alpines may be planted at almost any period of the year, as dealers keep the best kinds in pots; but planting from the ground may be done any time between autumn and spring when the ground is workable. *Slugs* are a source of considerable trouble to the rock gardener, and it will be found that they are the most abundant where a good deal of moist cover is provided by coarse plants. The repression of exuberant growth, and a periodical dusting with freshly-slaked lime, will keep them under. *Winter protection for Alpines :* Alpines will endure a great deal of cold, but those with woolly leaves are apt to suffer severely from wet, and consequently it is wise to set small squares of glass above choice kinds in order to throw off the rain. Plenty of chippings round the plants will also serve as a preventive of loss from damp. *Alpines in shade :* As we have seen, the great majority of Alpine plants love the sun, but there are a few desirable plants, notably Anemones blanda, Hepatica, and Robinsoniana, Campanula Hendersoni, Cyclamens, American Cowslips, Corydalises, Epimediums, Funkias, Gaultheria procumbens, Omphalodes verna, Orobus vernus, Primulas Japonica and rosea, Saxifraga Geum and the mossy varieties generally, Sisyrinchium grandiflorum, Thalictrum minus, Tiarella cordifolia, and the lovely white Wood Lily, Trillium grandiflorum, which enjoy shade. It is often practicable to provide that a certain part of the rockery shall have a northern aspect; if not, stones must be used so as to form shady corners. *Selections of rock plants :* The lover of Alpines learns about plants by travel in mountain regions, by visits to large botanical gardens, by inspection of collections at important flower shows, and by fraternising with amateurs of similar tastes. Meanwhile, beginners may be glad of the following list:—

Acaena microphylla
Acantholimon glumaceum
Achillea Clavennae
Adonis vernalis
Aethionema grandiflora
Ajuga reptans
Alyssum saxatile and the varieties compactum and variegatum
Androsace carnea
„ lanuginosa
„ sarmentosa
Anemone blanda
„ fulgens
Anemone Hepatica
„ Pulsatilla
Antennaria tomentosa
Anthemis aizoon
Antirrhinum asarina
Aquilegia Alpina
Arabis albida, also the double variety
Arenaria Balearica
Armeria cephalotes
Arnebia echioides
Aubrietia Dr. Mules
„ Graeca

Aubrietia Leichtlini
Campanula carpatica and C. alba
,, garganica
,, Portenschlagiana
Cerastium Biebersteinii
Cheiranthus Alpinus
,, Marshalli
Chrysanthemum Alpinum
Cistus ladaniferus
Colchicum speciosum
Corydalis nobilis
Cyclamen coum
,, Europaeum
Cypripedium Calceolus
,, macranthum
Daphne Blagayana
Delphinium nudicaule
Dianthus cruentus
,, deltoides
Dielytra spectabilis
Draba aizoides
Dryas octopetala
Edelweiss
Erica carnea
Erinus Alpinus
Eritrichium nanum
Erythronium grandiflorum
Gentiana acaulis
,, Andrewsii
,, Bavarica
,, verna
Geranium argenteum
,, Lancastriense
Geum montanum
Gypsophila repens
Helianthemums
Herniaria glabra
Heuchera sanguinea and varieties
Houstonia caerulea
Hutchinsia alpina
Hypericum olympicum
Iberis Garrexiana
,, Gibraltarica
Incarvillea Delavayi
,, grandiflora
Iris, *see* Iris
Lewisia rediviva
Linaria alpina
,, cymbalaria
Linnaea borealis
Linum alpinum
Lithospermum prostratum
Lychnis alpina
,, Lagascae
Meconopsis cambrica
Menziesia polifolia
Mertensia virginica
Muscari conicum Heavenly Blue
Myosotis alpestris and varieties (Forget-me-not)
Narcissus Bulbocodium
,, triandrus
Nierembergia rivularis
Oenothera caespitosa
,, fruticosa
Omphalodes verna
Ononis arvensis
Onosma Tauricum
Ornithogalum umbellatum
Orobus vernus
Ourisia coccinea
Papaver Alpinum
,, nudicaule (Iceland Poppy)
Pentstemon azureus
,, glaber
,, Hartwegii
Phlox amoena
,, reptans
,, subulata varieties
Polemonium Richardsoni
Potentilla formosa
Primula Japonica
,, marginata
,, rosea
,, viscosa
Ramondia pyrenaica
Ranunculus alpestris
,, Lyalli
Sanguinaria canadensis
Santolina incana
Saponaria ocymoides
Saxifraga aizoon
,, Burseriana
,, Camposi (Wallacei)
,, cotyledon
,, hypnoides
,, longifolia
,, oppositifolia
,, Megasea
Scabiosa caucasica
Scilla bifolia and varieties
Sedum acre

FLOWER GARDEN—*continued.*

Sedum album
„ caeruleum
„ glaucum
Sempervivum arachnoideum
„ montanum
„ Tectorum
Shortia galacifolia
Silene acaulis
Soldanella alpina
Statice incana
Sternbergia lutea
Thymus lanuginosus serpyllum
Trollius asiaticus
„ Europaeus
Tulipa Clusiana
„ Greigi
„ Leichtlini
Veronica gentianoides
„ repens
Viola biflora
„ calcarata
„ cornuta
„ cucullata
Waldsteinia trifolia



MAKING POCKETS FOR WATER LILIES.
1. Large stones. 2. Soil. 3. Plant. 4. Water.

The Water Garden.—The water garden can often be associated with the rock garden. Reference has been made to the desirability of providing different aspects, and forming cool bays. If water can be carried to one or more of these bays, and peaty soil is provided, a number of beautiful moisture-loving plants can be grown, such as Japanese Irises (Iris laevigata or Kaempferi varieties), Marsh Marigold (Caltha palustris), Water Violet (Hottonia palustris), Wood Lily (Trillium grandiflorum), Primula Japonica and P. rosea, the Water Flag (Iris Pseudacorus), the Water Soldier (Stratiotes aloides), the Flowering Rush (Butomus umbellatus), the Bog Bean (Menyanthes trifoliata), the Lady's Smock (Cardamine pratensis), the Lady's Slippers (Cypripedium Calceolus and C. spectabile), the Arrowhead (Sagittaria sagittifolia), the Water Hawthorn (Aponogeton distachyon), and the reeds Carex riparia variegata and Typha latifolia. A pool, puddled with clay or lined with cement, may be made for Water Lilies. If the plants are sunk in 2 to 3 ft. of water



A SMALL TANK FOR WATER LILIES

in April, with the roots packed in loam in pieces of old sacking, or bound round with moss, they will thrive. When the water is covered with flat brown, green, and purple leaves, and white, rose, yellow, and blue flowers, the pool will be a charming sight. The following are good hardy Water Lilies (Nymphaeas):—

James Brydon, red; Marliacea carnea, pink; M. chromatella, yellow; pygmaea, white.

Flowering Currant (Ribes sanguineum).—*See* Flower Garden—Shrubs.

Flowering Rush (Butomus umbellatus).—*See* Flower Garden—Water.

Flower-pots.—Pots are sold under number, according to the quantity in a cast, as follows:

Name.	Number in Cast.	Top Width in Inches.
ones	1	20
twos	2	18
fours	4	15
sixes	6	13
eights	8	12
twelves	12	11½
sixteens	16	9½
twenty-fours	24	8½
thirty-twos	32	6
forty-eights	48	4½
sixties	60	3
thumbs	80	2½

Clean flower-pots should always be used. New ones should be soaked in water a few hours.

Flowers, Cut, gathering and packing.—It is a good principle to cut flowers, except where seed is wanted, and there are few cases in which the plants are not benefited by it. Cutting the flowers while young prevents them from setting seed, which is the most exhausting process a plant undergoes; gathering is therefore an incentive to continuous flowering. There are, however, a few kinds that must only be cut with care and judgment, because the new growth springs from the base of the bloom-truss. Azaleas, Camellias, and Rhododendrons may be quoted as instances. The cutting of flowers is often a bone of contention between employers and gardeners, the latter contending that the appearance of plants is spoiled by careless cutting. Gathering may, however, be done in such a way as to leave the effect of the plants unimpaired, and it should be done with discrimination. To gather a dozen flowers from one plant might affect a bed or border, but to gather 2 or 3 flowers from each of several plants would leave no gap. If flowers get somewhat flaccid they may be put into hot water. The flowers of hard-wooded plants, such as Azaleas, keep longer if the base of the stem is lightly scraped with a knife before they are put in the vases. Flowers generally look best in vases and bowls when little mixing of kinds is done;

there may, however, be judicious blending of colours, such as (1) red, white, and blue; (2) salmon and lavender; (3) cream and pink. In packing flowers avoid using dry cotton wool, as it absorbs moisture. If this material is ever employed it should be in the form of a damp wad round the base of the stems. A little damp moss may be used in the same way. The flowers themselves should be dry, and should be packed firmly, preferably in tissue or butter paper. In cutting for show it is best to cut in the afternoon or evening, and keep the flowers in a cool, dark place, with the stems in water, until they can be set up on the boards.

Fly, Green, Black, etc.—*See* Aphides.

Foam Flower, Tiarella cordifolia.

Foreright shoots.—*See* Fruit—Breastwood.

Forget-me-not.—A delightful flower-garden favourite, best raised from seed annually (*see* Biennials), except in the case of the Alpine species, which may be sown as required, or increased by division. The Forget-me-nots are charming among late bulbs, planted in autumn and lifted after flowering in spring. For this purpose none is better than Mysotis dissitiflora, as it is dwarf and compact. There are several varieties of it. Sylvatica is taller, but very bright. Palustris is the best for damp places. Alpestris and its varieties are good for the rockery.

Fork.—*See* Digging.

Forsythia, Golden Bell (forsȳth-ia, after Mr. Forsyth. Ord. Oleaceae).—One of the most valuable deciduous shrubs, blooming very early in advance of the leaves and wreathed in yellow flowers from top to bottom. Two species are popular, suspensa and viridissima. Intermedia is a hybrid between the two. They grow 6 to 8 ft. high. Any well-tilled, fertile soil suits them. They should be planted in autumn. After flowering the old wood may be cut out to make room for young, which will flower the following year. Propagation is by cuttings in summer or layers in autumn. Fortunei and Sieboldi are varieties of suspensa.

Foxglove.—*See* Biennials and Digitalis.

Fragaria (fragā-ria, from *fragrans*, in reference to the perfume. Ord. Rosaceae).—Indica, which has yellow flowers in early summer, is grown on rockwork. F. vesca semperflorens is the Alpine Strawberry. *See* Fruit.

Frame.—A frame is very useful in a garden. With a hotbed beneath it (*see* Hotbeds) it may be utilised for raising tender plants in spring, growing Cucumbers in summer, and forcing Violets in autumn. Unheated, it will prove serviceable for raising half-hardy plants and hardening garden plants which have been raised in heat. A two-light frame, 18 ins. deep at the back and 14 in front, each sash 6 ft. by 4, will answer well.

Francoa, Bridal Wreath (francō-a, after Señor Franco. Ord. Saxifrageae).—F. ramosa is a graceful plant, with long, arching spikes of small white flowers. It thrives in a cool greenhouse, and when

in bloom can be drafted into the window of a room, where it will overhang the other plants and impart a loose, pleasing effect. It can be raised from seed, which may be sown in a warm frame or greenhouse in spring, the seedlings pricked off, potted and repotted as needed. Five-inch pots will be large enough to flower them in, and loam, with a fourth of leaf mould or decayed manure, and some sand, will do for compost. *See* the *Botanical Magazine*, t. 3824.

Fraxinus, Ash (frăx-inus, from the Latin. Ord. Oleineae).—The common Ash is Fraxinus Excelsior, a British tree flowering in May, with very tough, flexible wood. There are many varieties of it, such as aucubaefolia, aurea, heterophylla variegata, and pendula. Americana is the White Ash. Ornus is the Manna or Flowering Ash. There are several varieties of both. Ash trees should not be planted in small gardens.

Freesia (frēēs-ia, a personal name. Ord. Irideae).—*See* Bulbs.

French Bean.—*See* Kitchen Garden.

French Gardening.—What is known as French gardening is the concentrated manuring of the top spit of soil until it becomes a black mould, and the forcing in it under frames and cloches of a number of vegetables, mainly salads, that lend themselves to intensive culture. It is not wholly new to British gardeners; on the contrary, the main principles have been practised for many years, but less effort has been spent on the top soil, fewer cloches have been used, and the number of different salads has been smaller. French gardening in its most "intensified" form needs expensive equipment, and must not be entered upon without careful consideration. If walls and glass houses are erected (and protection of some kind is absolutely necessary) and the garden is well equipped with pits, frames, and adequate heating, the cost may be expected to be from £700 to £1000 per acre. This would not be justified unless there was a good market for the produce, hence the necessity of caution. The principal appliances required for a French garden are reed mats—which must be dressed with Bordeaux Mixture as a fungicide and preservative—frames, and cloches. The principal crops grown are Cauliflowers, Cucumbers, Melons, Tomatoes, Chicory, Spinach, Parsley, Lettuces, Mushrooms, Radishes, Endive, Beans, Carrots, and Turnips. Attention must be given to cropping the ground successionally. Those who are embarking capital in French gardening should consult a reliable work on the subject. *See also* Kitchen Garden.

French Marigold.—*See* Annuals.

Fritillaria, Snake's Head Lily, Crown Imperial (fritillā-ria, from *fritillus*, a chess-board, in allusion to the chequered flowers. Ord. Liliaceae).—*See* Bulbs. F. Meleagris is the Snake's Head Lily, F. Imperialis the Crown Imperial. Armena, with purple flowers, also a yellow variety: aurea, yellow; and recurva, red and yellow, are all good for the rockery, and bloom in spring.

Frost.—Frost is most likely to occur on autumn, winter, or spring nights, when the sky is clear, and heat escapes from the earth by

radiation. In cloudy weather this radiation is checked. Frost is likely to be the most severe on low sites, but the presence of a body of water modifies it. If non-hardy plants are frozen they should not be exposed to the sun, but should be syringed. Plants in unheated houses should be dry before evening. A few sheets of newspaper will protect the plants against a mild frost. "Smudge fires" are coming into use among fruit growers to protect blossom. Cotton waste is burned in Colorado heaters, of which 40 to 50 are required per acre. Frost acts beneficially on soil.

Fruit.—A supply of fruit should be regarded as indispensable in all but the smallest gardens, and even in these it is possible to grow a few trees, either as bushes on dwarfing stocks, as cordons on a wall or fence, or as fans on a wall. Apples, Pears, Plums, Cherries, Apricots, Damsons, Currants, Gooseberries, Raspberries, and Strawberries all claim attention, while Peaches, Grapes, Loganberries, and Blackberries have also to be considered. Crabs, Damsons, Figs, Melons, Mulberries, Nuts, Oranges, and Quinces swell the list. The fruits named are dealt with in alphabetical order. There are, however, certain general points that may be dealt with here, to save repetition.

Soil.—A cold subsoil is bad for all kinds of fruit trees; it is therefore imprudent to plant in damp, undrained ground. If a low site is unavoidable, drain pipes should be laid in 3 ft. deep. The best soil for fruit is a reddish, substantial loam; the least suitable soils are heavy, undrained damp clay and light fibreless land close to chalk. The soil should be dug or ploughed deeply.

Site.—Windswept places are bad, and so are low spots. Strong winds worry the trees and blow the fruit off. In low sites frost is liable to do damage to the blossom, but a body of water near is a preventive. A south-easterly aspect is unsuitable, because the sun may strike direct on to the trees while the bloom is touched by frost and destroy the crop. For this reason a south-westerly aspect is better.

Manure.—Fruit trees are generally manured when young, and receive little food when they have got into bearing. The reverse would be better. In rich, loamy soils, 20 tons of manure per acre, or 1 barrow-load per rod, suffice at planting. In poor ground half as much again may be used. When the trees have got into regular bearing a coat of manure may be spread round them every other year, alternately with a dressing of artificial manure, such as 2 lb. of sulphate of potash and 5 lb. of basic slag (superphosphate instead of the latter on limestone soils) per rod, applied in February and raked in.

Grass.—Only in good soil districts should the fruit trees be planted in grass. Some market growers are doing away with grass where sheep do not pay and keeping the soil open. The early crops of weeds are kept under by running the shim through the orchard, and the autumn crop is turned in with the fork or a one-horse plough. It is found that the fruit comes larger, but what falls is not so clean as on grass.

Planting.—November is a good planting month, as the soil has not lost all its summer warmth, but if the ground is very wet it is

better to plant later, and it may be done up to the end of March. Standard and half-standard trees should be set 24 ft. apart, the distance to be increased to 30 ft. for Bramley's Seedling, Newton Wonder, Emperor Alexander, Lane's Prince Albert, Blenheim Orange, and other strong Apples, also for Plums and Cherries. Bush and pyramid trees on dwarfing stocks may be 12 ft. apart.

Pruning.—Practically all fruit trees require shortening when young. If they are allowed to grow right away from the bud or graft (*see* Budding and Grafting) they make lank growth, and the lower part of the tree is bare. A first-year (" maiden ") tree should be pruned back to 6 buds in winter, or before it starts growing in spring. A two-year-old tree should have its side branches shortened by three-quarters, and a three-year-old tree, after transplanting, by one-half. A three-year-old half-standard or standard should be shortened by at least two-thirds when transplanted.

Summer pruning.—This does not concern shortening the main branches to get a good head, but deals with the summer side shoots to get fruit. It is a good practice, because it exposes the wood to the sun and accelerates ripening. Those who want to grow exhibition fruit, and have plenty of time, may pinch off the tips of the side shoots at the end of May, and serve the secondary shoots that break in the same way 6 weeks later; but busy people and market growers should make one pruning suffice, and do it from mid-August to mid-September. This applies to Apples, Pears, Plums, red Currants, and Gooseberries.

Gathering.—Generally speaking, fruit should be gathered as soon as it parts from the tree under gentle pressure on the stalk. Late varieties do not ripen on the trees, and should be gathered before sharp frost comes. The fruit should be placed in the receptacles gently, as if bruised it will not keep.

Storing.—All the important fruits, except Apples, Pears, and Grapes, are either used at once or preserved. Late Apples and Pears will keep for several months in a cool, airy, frost-proof place if spread thinly on clean boards. Grapes may be kept a long time if cut with a portion of the lateral and this placed in a bottle of water.



Pruning Young Standard Fruit Trees.

1. Point of previous pruning. 2. Side shoots with young growths (3) to be pruned at the bars (4). 5. Shoot to be removed entirely.

Types of tree.—The most popular types are the standard, the half-standard, the bush, the pyramid, the fan, the espalier, and the cordon. Standards and half-standards have clean, straight stems about 6 and 3 ft. high

respectively. They are generally raised by inserting a bud in the main stem of a stock (for best stocks, *see* the various fruits) a few inches above the ground in summer. If the bud dries up, the stock is cut back to about 6 ins. and whip-grafted (*see* Grafting) the following spring. Some nurserymen supply standards with fruit spurs on the stems, and these spurs may be kept for a few years, but should be gradually cleared away as the heads extend. Bushes and pyramids are generally put on dwarfing stocks by budding or grafting. Bushes are gradually supplanting standards, except perhaps with market growers. They are planted about half the distance apart, as we have seen, generally on cultivated ground, not grass land. They are better than standards for small gardens, and come into bearing sooner. Fans are good for walls, especially in the case of Plums, Cherries, and Peaches. Espaliers are trees with several tiers of horizontal branches, and are very good for growing on strained wires at the side of walks. Cordons take up the least room of all. They are trees with only one stem, and may be planted diagonally 2 ft. apart against a wall or fence. They are prevented from making side branches, and are kept fruitful by summer pruning. Horizontal cordons suitable for training on low strained wires are procurable.



STANDARD FRUIT TREE AFTER BEING PRUNED THE PREVIOUS WINTER.

1 and 2. Main stem. 3. Points of previous year's pruning. 4. Spurs. 5. Young shoots that ought to be pruned at the bars, otherwise they will break weakly at the tips (6). 7. Shoots which have been summer pruned marked for shortening.

Staking.—Standards need staking, and half-standards are the better for it. Strong ash stakes about 18 ins. longer than the stems are needed. The lower end should be painted, tarred, and after drying driven well down at the time the hole is made for planting. At the point where the ligature is put, a piece of old bicycle tyre or other pro-

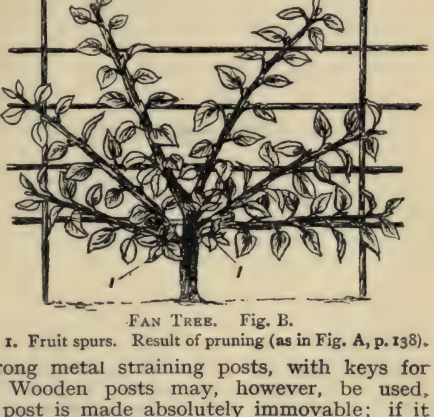


FAN TREE. Fig. A.

1. Stock. 2. First pruning. 3. Summer growth. 4. Second pruning.

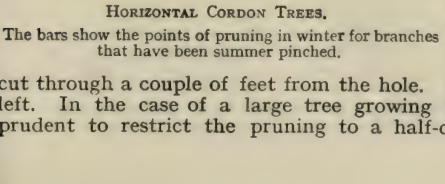
tective substance should be wrapped round the stem to prevent chafing.

Supports for trained trees.—Bushes and pyramids do not need supports, but fans, espaliers, and cordons do. In the case of walls, shreds and nails may be used, and the fruit dealer or seedsman will supply suitable kinds of both. Otherwise, wire comes into play. One wire fixed 2 ft. above the ground will support horizontal cordons, which, however, are inferior to upright ones. Upright cordons, and also espaliers, may be supported on tiers of wire strained a foot apart to a total height of 6 or 7 ft. Fruit dealers, seedsmen, and ironmongers supply strong metal straining posts, with keys for tightening the wires. Wooden posts may, however, be used, provided the straining post is made absolutely immovable; if it yields only 2 or 3 ins. the wires will be slack. It should be a strong, thick post that will hold stiff from bottom to top when well bedded in. Single wire will do, although strand wire is often used. It should be unwound from a reel, otherwise it will run into bends and be full of kinks before the work is finished.



Fan Tree. Fig. B.
1. Fruit spurs. Result of pruning (as in Fig. A, p. 138).

Root pruning.—When fruit trees have been planted 2 or 3 years it sometimes happens that they grow far too strongly, especially if the soil is rich and the summers are wet. To use figures as a guide, if the summer shoots grow over a yard in length fruitfulness is jeopardised, because when a tree makes coarse wood it does not, as a rule, form fruit buds. The remedy is not cutting back the gross wood, which only causes back buds to start and so aggravates the evil, but to prune the roots in winter when the tree is at rest. The soil should be forked away from the roots carefully, and the strong, far-running, deep-striking roots cut through a couple of feet from the hole. Fibrous roots may be left. In the case of a large tree growing in the open it will be prudent to restrict the pruning to a half-circuit of the tree; if



Horizontal Cordon Trees.
The bars show the points of pruning in winter for branches that have been summer pinched.

FRUIT—*continued.*

this does not suffice the circle may be completed the following winter.

Fruit trees in pots.—Now that glass houses are relatively cheap the culture of what is known as orchard-house fruit is extending. When the trees are grown in large pots or tubs they bear heavy crops in proportion to their size, the bloom is protected from frost and the fruit from birds. Heated houses are not required. The structures should be large, airy, light, and well ventilated. Apples, Pears, Plums, Cherries, Peaches, and Nectarines can all be grown successfully as bushes in 10 and 12-in. pots. The soil may be decayed turf with a fourth of decayed manure and some grit. Every other year will suffice for repotting; in the alternate years the top 2 ins. of soil and hair roots may be torn out and a top dressing of fresh mould rammed in. The trees may stand out of doors in summer after the fruit has been gathered to ripen the wood, indeed they may be left out all the winter, with the pots packed in coal ashes, if the house is wanted for something else, and housed when they come into bloom in spring. Watering and keeping free from insects and fungi must be attended to in the growing season. Liquid manure will improve the crop. Six or eight main branches will suffice, and the side shoots may be summer pruned and spurred (*see* under Apple).



COIL WIRE LABEL WHICH DOES NOT INJURE THE GROWING TREE.

Labelling.—All fruit trees should be labelled, or their names and positions in the garden marked on a plan. But wire should not be fastened round a young branch and forgotten, or it will become embedded as the tree grows.

The following are the principal fruits in alphabetical order:—

Apple (Pyrus malus).—It would be difficult to write too emphatically in commending the Apple, for it is valuable as a food, useful as a medicine, beautiful in appearance, delicious in flavour, and may be grown in many forms. Every owner of a garden should grow Apples. The planting, pruning, and general culture will interest him, the flowers will please his eye, and the fruit will prove both enjoyable and wholesome. The Apple is a very old fruit in British gardens, and the tree is perfectly hardy. It is not, however, equally at home in every district. All the many varieties do not thrive equally well on all soils. The Apple must be studied, therefore, if satisfactory results are to be secured. *Classification :* Apples are subdivided into two great classes: varieties for cooking and varieties for dessert. A few are good for either purpose, and a notable example is the old Blenheim Orange; but for general purposes the two sections must be kept separate. Subdivision may take the form of providing classes for early, medium, and late-maturing sorts. *Stocks :* Apples are rarely grown from seeds or cuttings nowadays,

but are budded or grafted on to allied plants. The reason of this is that better habit, or earlier fruiting, as the case may be, is secured. At the outset, therefore, of a consideration of Apples we have to treat the question of stocks. The best stock for "standard" trees —that is, trees with a branching head springing from a long, clean stem—is the English Crab. It is very hardy, very healthy, and has a strong rooting system. It does not, however, give early fruit. The best stocks for dwarf trees, the branches of which spring from a main stem a foot or two from the ground, are the Broad-leaved English Paradise and the Nonsuch. Both of these give good habit, abundance of surface roots, and early fruiting. When comparing the cost of Apple trees from different dealers the stock used should be taken into account. "Free" stocks are cheaper than Crabs, and the narrow-leaved French Paradise is cheaper than the broad-leaved English. The stocks are raised from seed, cuttings, or layers; and should be ready for "working" in their third year. *Budding :* In budding a stock, a young shoot of the Apple which is to be propagated is taken about midsummer, and slices about 1½ in. long are removed under the leaves. The pith is picked out without tearing away the growing germ, the leaf is cropped in to the stalk, and the "bud" is inserted in a T-shaped slit made in the main stem of the stock near the ground, and tied with raphia. It will grow the following spring; if it dies, the top of the stock should be cut off and a whip or tongue graft put on. This is a piece of Apple shoot about 4 ins. long and as thick as a lead pencil. For further particulars, *see* Grafting. The propagation of fruit trees is not much done in private gardens, being left to trade specialists. *Planting :* Apples may be planted from November to March inclusive. For details, *see* above. *Soil :* The best soil for Apples is friable, well-drained loam or brick-earth. Chalk in the form of ragstone rock is good as a deep subsoil, being relatively warm and well drained, but is not suitable for most varieties when it lies close to the surface. Undrained clay is bad for most sorts. *Site, Staking, Manure, Pruning : See* under Fruit above. *Training :* Apples may be grown as open bushes, standards, cordons, and espaliers; for details, *see* under Fruit above. Open bushes on the Paradise stock are best for garden quarters, standards for orchards, cordons for walls, and espaliers for wire frames at the side of paths. *Varieties :* The fact that the sorts of Apples vary, not only in their flavour, but in their season of maturing and their suitability for particular soils, renders the matter of selection a difficult one. The following suggestions may be found helpful:—

Good Cooking Apples.
Lord Grosvenor
Early Victoria
Bismarck
Stirling Castle
Ecklinville Seedling
Royal Jubilee
Lord Derby
Peasgood's Nonsuch
Golden Spire
Warner's King
Wellington
Newton Wonder
Lane's Prince Albert
Bramley's Seedling

Good Dessert Apples.
Gladstone
Beauty of Bath

FRUIT, APPLES—*continued.*

Worcester Pearmain	Baumann's Red Winter Reinette
Allington Pippin	Sturmer Pippin
James Grieve	Claygate Pearmain
Belle de Boskoop	Winter Queening
Cox's Orange Pippin	Duke of Devonshire
Christmas Pearmain	Roundway Magnum Bonum

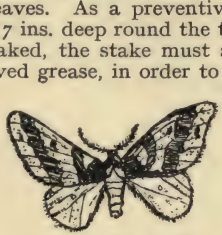
The earliest varieties are put at the top of the lists and the latest at the bottom.

Newer Varieties worth trying.

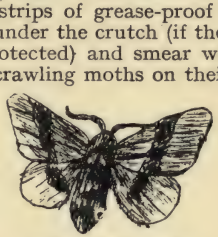
Cooking.	*Dessert.*
Red Victoria	Ben's Red
Revd. W. Wilks	Langley Pippin
Byford Wonder	Charles Ross
Beauty of Stoke	Winter Ribston
Norfolk Beauty	Wm. Crump
King Edward VII.	Rival
Crimson Bramley	Coronation

Those who have very light soil should plant Lord Suffield, King of Tompkins County, and Bramley's Seedling. The last-named will also thrive in heavy soil, and it may be accompanied on such a medium by Lord Grosvenor, Lord Derby, and Newton Wonder. The following should be omitted from strong-soil gardens: Stirling Castle, Ecklinville, Warner's King, Wellington, and Lord Suffield, as they are very liable to canker on such ground. *Canker* is perhaps the most destructive of all Apple enemies. It rarely attacks Bramley's Seedling, and Newton Wonder, Lord Grosvenor, and Lane's Prince Albert are generally free. The disease is very prevalent on wet, stiff soils, but it is also severe on light, shallow ground, and there are few places where it is not present. Varieties that suffer from canker in the district should be avoided. When the disease shows itself in the form of crinkly patches and bare pieces of wood, the wounds should be pared clean and painted with tar. A dressing of manure should be given. *Black Scab.*—This affects the shoots and fruit, causing dark patches and cracks. The remedy is to spray with a pound of bluestone dissolved in 25 gallons of water when the leaves are unfolding, repeating when the petals fall, and again a fortnight later. Powdery mildew affects the young shoots, covering the ends with a white meal. The remedy is ½ oz. of fresh liver of sulphur (sulphide of potassium) dissolved in a gallon of water, and sprayed on when the disease is seen. Brown spot affects the fruit. Small brown dots are seen, which disfigure the fruit, and, working into the flesh, cause decay. The remedy is again liver of sulphur, at the strength just recommended, sprayed on as soon as the spot appears. American blight causes white fluffy patches on the branches and roots. The remedy is to syringe or hose vigorously so as to force off the protecting fluff and expose the brown aphis underneath, then to spray with a paraffin oil and soft soap solution (*see* Paraffin oil). *Sucker or Psylla :* This is a light green slender insect about an eighth of an inch long, which

may be seen in flight in autumn, when it lays eggs on the shoots of Apple and other trees; these hatch into wingless yellow larvae in spring that feed on the buds. A good remedy is to spray with lime-water in spring, just before the buds start, using 40 lb. of lime to 25 gallons of water. The best white stone lime is necessary, and it should be slacked in a small quantity of water first. *Caterpillars :* Several caterpillars attack Apples, but the worst is that of the winter moth, which ascends the trees in autumn and lays eggs that hatch the following spring. The caterpillars feed on the bloom trusses and leaves. As a preventive, fasten strips of grease-proof paper about 7 ins. deep round the trees just under the crutch (if the trees are staked, the stake must also be protected) and smear with an approved grease, in order to trap the crawling moths on their way



THE WINTER MOTH.



THE LACKEY MOTH.

up. If caterpillars should appear in spring in spite of this precaution, spray with arsenate paste, ½ oz. per gallon of water, directly they are seen. *Codlin Grub :* This comes from eggs laid in the eye of the fruit directly it forms. The grub eats into the fruit, and leaves a train of foul matter behind it. The remedy is to spray with the arsenate paste wash directly the flowers set. *Blossom Weevil :* In some districts a weevil eats into the fruit bud just before the breaking stages, and, destroying the fertilising organs, prevents fruit forming; the lime spray recommended under Sucker is good. *Moss and lichen :* When the branches of fruit trees tend to become green they should be cleansed. A lime spray is an excellent cleanser, but in bad cases something more may be required, and it may be found in caustic soda. One pound of this, with 1 lb. of pearl-ash, in 10 gallons of water, will cleanse the wood if sprayed on in winter.

Apricot (Prunus (Armeniaca) vulgaris).—One of the most delicious of the stone fruits, the Apricot is also one of the most capricious. It is difficult to suit in soil, and even in good loam on limestone—which is the ideal soil for fruit—it often casts its main branches after a few years. It should be given firm soil with plenty of lime rubble. It blooms very early, and on this account should not only have the protection and support of a wall, but should have tiffany or netting hung in front of it while in flower when frost threatens. In starting with Apricots it is best to buy a young trained tree from a fruit dealer, and plant it in autumn. If it grows very strongly root prune it. The summer side shoots may be shortened as advised for summer pruning under Fruit. Varieties: Blenheim, Moor Park, Powell's Late.

Blackberry or Bramble (Rubus fruticosus).—A wilding in Great Britain, where it is a feature of many hedgerows, and its fruit is

FRUIT—*continued.*

much sought after in late summer for stewing purposes, and also for making jelly. The improved varieties are well worth growing in gardens where the soil is deep, fertile, and moist; but they are of little use in dry, shallow soils. As they are often shy in starting it is wise to adopt the plan generally practised with Raspberries, and prune them hard back at planting time in autumn. This generally induces them to break from below. Thereafter they can be kept in order by thinning out old fruited wood. If more are wanted they can be got by bending the canes over and pegging down the tips in late summer, or by dividing the stools in autumn. Parsley-leaved is a good variety, with large, richly flavoured fruit.

Cherry (Prunus Cerasus).—The Cherry is suitable for culture as a standard or half-standard on the Gean stock, and also as a trained tree for walls on the Mahaleb stock. It is not often grown as a bush, pyramid, or cordon. It likes a loamy soil on limestone. On rich, deep, substantial " brick-earth " loams with ragstone beneath it grows to a great size and crops heavily. The general remarks under Fruit apply. With regard to pruning, while early cutting back and shaping is necessary, little subsequent pruning should be done, otherwise the trees may throw out gum and die. If they get too thick, thin them while full of leaf in summer to avoid gumming; they do not, however, make a thick mass of wood, as a rule, if the early pruning has been done judiciously; on the contrary, they make fruiting spurs. The Morello Cherry bears on the young shoots, so that only old fruited pieces should be cut out. The new wood should be left. Cherries are not troubled much with canker, but they may be attacked by caterpillars and silver leaf (*see* under Fruit and Plum). Trees on walls are sometimes attacked by black fly, which clusters in the tips of the young shoots. It may be destroyed by syringing with a solution of paraffin and soft soap (*see* Paraffin oil), or with almost any of the proprietary insecticides sold by seedsmen. Very hot water, with an ounce of washing soda to the gallon, syringed on forcibly, is efficacious. Some growers pinch out the tips of the shoots in May to avoid the fly. When the Cherry is grown as a trained tree it is found that it does better with the branches fastened horizontally than diagonally or vertically. Bone meal and sulphate of potash, 2 oz. of each per square yard in March, will do good. Varieties: Black Eagle, Governor Wood, Napoleon Bigarreau, Morello, and Kentish, the last two for cooking.

Crab, Ornamental (Pyrus acerba).—The ordinary Crab is only of value to fruit growers as a stock (*see* Apples), but the better species, which are generally described as " Ornamental Crabs " by fruit dealers, are worth growing, alike for their beauty and for the use of the fruit for jelly. They are generally grown as standards, and will thrive under the conditions recommended for Apples. The fruit is small, but it is borne in considerable quantities and is brilliantly coloured. The four most popular varieties are Dartmouth, John Downie, Siberian, and Transcendent.

Currant (Ribes nigrum rubrum and album).—The reader must

not confuse the garden and the grocer's Currants. The former are true Currants, the latter are Grapes, and belong to a different genus. Black and red—and in a less degree white—Currants are very useful garden fruits, for they are excellent stewed, make delicious jellies, and are not entirely negligible for eating raw. The black Currant is easily grown in any fairly deep, fertile soil; it does not care for poor, dry, shallow ground. The large modern varieties are vigorous growers, and should be planted at least 6 ft. apart; 8 ft. is not too much. They may be planted, with other fruit, from November to March inclusive, either in a quarter to themselves, or among large trees, such as standard and half-standard Apples and Plums; but they should not be put close to the stems of the latter, or both fruits will suffer by robbing each other of the food in the soil. *Propagation :* Currants are not put on to stocks, like Apples, Pears, Cherries, and Plums, but are struck from cuttings of the same year's wood, taken about a foot long, and inserted firmly in September. The following year the young shoots are cut back to about 3 ins. long, and a year later shortened one-half. This makes bushes of them by encouraging them to form side branches. The growths may be left to extend, and any sucker shoots which come up from the roots may also be retained. Thereafter pruning will merely consist in thinning out old wood which has fruited; but a black Currant must never be cleared of young wood, because that bears the best fruit. This most useful fruit is unfortunately harassed by a destructive enemy in the form of a mite (Eriophyes ribis), which gets into the heart of the buds, feeds on the substance, and kills the trees. Its presence may be known by the buds becoming swollen and rounded. The best remedy is to cut out and burn any affected shoots directly they are noticed, and to dust the trees at the end of March with 2 parts flowers of sulphur and 1 part freshly slacked lime, repeating at the middle of April and the beginning of May. This should be done while the trees are damp with dew. Boskoop Giant and Baldwin's are two good varieties. The red Currant is little, if any, less useful than the black, and as it grows in closer form, and bears on the old wood, it needs less room, while yielding quite as heavily. It is a most useful fruit, and will grow in most soils, unless they are either very poor, shallow, and dry, or very stiff and wet. The bushes are raised from cuttings the same as blacks, except that it is customary to prevent sucker growth from the base by removing the buds on the lower half of the cutting and also for 3 or 4 ins. above the ground so as to allow of a clean stem. The early pruning should be the same, but the later pruning should differ in shortening the young wood, which should be done annually, preferably in summer. The red Currant is not subject to the mite which works such havoc with the black, and is generally a very healthy plant. Red Dutch and Fay's Prolific are good varieties. White Versailles is a useful Currant, and requires just the same treatment as the red varieties.

Damson and Bullace (Prunus insititia).—The Damson is one of the hardiest and toughest of fruits, and on that account is often put on the outside of plantations, in order to serve as a wind-break and to protect more valuable trees. The fruit is useful for stewing, and

FRUIT—*continued.*

also for preserving; it is less luscious than the good Plums. It is suitable for culture as a standard. The remarks on culture made under Plum apply to the Damson. It needs very little pruning when once in bearing. Varieties: Prune, Bradley's King. The Bullace is an inferior Damson, and need not be grown.

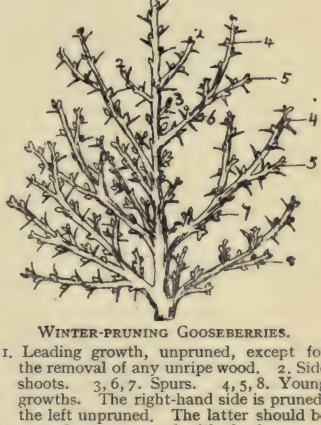
Fig (Ficus Carica).—The Fig is a very old and esteemed fruit, but it is not cultivated in the majority of small gardens. There are two things against it: its rampant habit and its want of complete hardiness. It is sometimes given a snug corner in the angle of two walls, and then, with a little shaping to keep it within bounds, it justifies its existence; but if neglected it is apt to straggle badly and become rather a nuisance. In such a case root pruning (*see* Fruit, p. 139) will do good. A firm soil with plenty of lime is desirable. The trees may be planted in autumn or spring. If increase is desired it may be effected by cuttings of mature wood each containing a couple of buds, which may be inserted in sandy soil in winter and plunged in a mild hotbed or stood in a warm house Figs are sometimes grown in pots in large establishments, and the best varieties yield delicious fruit. They give two and even three crops in a year. Thus pruning must be done guardedly, or fruiting wood may be cut away. If the pruning is restricted to thinning crowded bushes, and is mainly concentrated on removing shoots from which fruit has been gathered, the grower does not go far wrong. Brown Turkey is about the best variety for outdoors. It is also good for pots, and so is Negro Largo. Where a feature is made of Figs, St. John's may be added for its earliness, and Grizzly Bourjasotte for its fine flavour.



FRUITING OF OUTDOOR FIG.
The first (lower) fruits swell and ripen. The second crop (see small fruits above) hang through the winter and fall in spring.

Gooseberry (Ribes Grossularia).—The Gooseberry is an old cottage and hall garden fruit that is familiar on every countryside. It has been growing in British gardens as long as the "immemorial Elms." Unfortunately, familiarity has bred contempt, and the Gooseberry bush has been left very much to itself. Such a course could have but one end in any fertile soil—a thick mass of interlacing shoots and small fruit difficult to gather. The Gooseberry is a really useful fruit, and it responds so readily to a very simple course of culture that, common as it is, it ought to be treated well. Like the Currants, it is generally grown on its own roots, being struck, as they are, from cuttings in late summer, and subsequently shortened in the same way. Like the red Currant it is best on a clean stem. Spiny shoots springing up in a thicket from the roots are a nuisance to the grower, and should be avoided by picking the lower buds from

the cuttings. It is a double advantage to keep the Gooseberry bushes well open when they get to the fruiting stage, as larger berries are produced, and they can be gathered more quickly. This can be effected by restricting the number of main branches to 7 or 8, and shortening the young side shoots in summer. The stumps can be pruned back close to the buds in winter. The Gooseberry likes a fertile, loamy soil. As a rule it does not care for clay, but the splendid variety Crown Bob—one of the best of all—thrives on heavy ground if the drainage is good. The Gooseberry has many enemies, and small birds have to be taken into account, for they attack the dormant buds in winter, and often strip many bushes almost entirely. This is a great nuisance, as the crop is reduced and the health of the bush impaired. In small cultures lime-spraying the bushes (*see* Fruit, p. 143) is good, or black thread may be twined among the shoots. It is doubtful whether either would pay in large cultures for market, but Gooseberries are often grown under big trees that are lime-sprayed, and benefit by the process. Red spider, a small mite, may attack Gooseberries and do a great deal of damage, but it is rarely very bad except in dry, dusty places. A part of a plantation near a high-road may suffer and the inner portions be quite clean. More serious is the American Gooseberry mildew, which attacks the young growing shoots, causing purplish patches on the wood. In bad cases it spreads to the fruit, covering it with a mat of down and spoiling it. This enemy should be looked for in May and June, and should be combated by cutting off and burning the affected shoots and spraying the bushes with liver of sulphur, ½ oz. per gallon of water. Another serious enemy is the caterpillar, which attacks the foliage in early summer, and when present in force does great damage. The remedy for this is hellebore powder dusted over the bushes as soon as caterpillars are seen, but not when the fruit is at the picking stage. Well-pruned Gooseberry bushes will do 6 ft. apart. There is now a considerable demand for standard Gooseberries, which are not grown from cuttings, but are grafted on to stocks of Ribes aureum and allied species. They are suitable for private gardens, and when well grown yield splendid fruit. Gooseberries also give very fine berries when treated as cordons, that is, spur pruned to a main stem and no side branches allowed. In such a form they can be grown against walls and fences. Varieties: Crown Bob, Whinham's Industry, and Whitesmith. If sorts are wanted of fine flavour



WINTER-PRUNING GOOSEBERRIES.

1. Leading growth, unpruned, except for the removal of any unripe wood. 2, Side shoots. 3, 6, 7. Spurs. 4, 5, 8. Young growths. The right-hand side is pruned, the left unpruned. The latter should be pruned to correspond with the former.

FRUIT—*continued.*

Early Sulphur, Rough Red, Red Champagne, Pitmaston Greengage, Bright Venus, and Langley Gem may be chosen. Rifleman, Antagonist, and Leveller are three large varieties.

Grape Vine (Vitis Vinifera).—The Grape is one of the oldest fruits cultivated in British gardens. It was probably found in Egypt. In mediaeval times it was grown somewhat extensively in the open air, but cheap glass has enabled us to grow superior crops economically

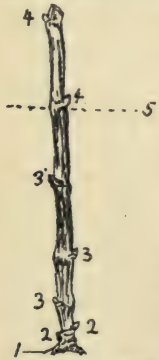


PROPAGATING VINES BY EYES.
A bud or eye cut from a piece of ripe tateral.



PROPAGATING VINES BY EYES.
Growth starting.

in houses, and outside wall space is now given to cordon fruit trees, or to beautiful flowering climbers. The Grape Vine is an interesting fruit to grow from first to last, and is well within the scope of amateurs. *Propagation :* The plants are grown on their own roots, like the majority of the soft fruits, and may be struck either from buds or cuttings while dormant in winter. A bud (technically termed an " eye ") is a short piece of side growth with one plump bud on it, and several are placed 2 ins. apart in prepared soil in a large pot. The compost may consist of loam with a third of leaf mould and a liberal sprinkling of sand. If it is kept moist, and the pots are plunged in a mild hotbed, the eyes soon start. But the rank and file of Grape growers would do well to leave this work to fruit dealers, who can raise better plants than amateurs. *Vineries :* Grapes can be grown well in any light house, but a wide lean-to is more convenient than a span roof. Amateurs often get nice crops from small houses when they resist the temptation of crowding in all kinds of other plants. By planting the vines 4 ft. apart at the front of the house they have a clear run up the roof as far as the back wall. The vinery should be light and well provided with ventilators. It is not necessary that it be heated unless early Grapes are wanted, but it is advisable to have hot-water pipes in it, if only a flow and return 4-in. circuit. Wires should be strained under the roof 18 ins. from the glass. *Soil :* An inside border, consisting of 3 ft. of old turves, with some broken bones and lime

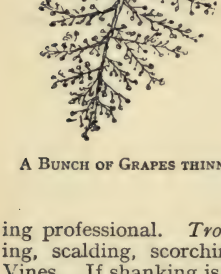


PROPAGATING VINES BY CUTTINGS.
1. Heel of old wood. 2. Basal buds (to be removed). 3. Stem buds (to be removed). 4. Top buds to be retained. 5. Depth to insert.

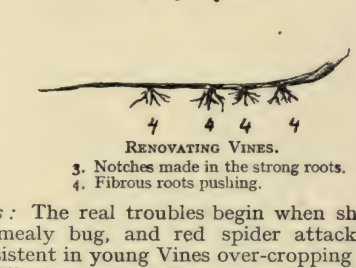
rubbish mixed in, will grow Grapes well. If the site is damp it should be drained, otherwise the roots will get into sour, waterlogged soil, and the bunches will "shank"—that is, the footstalks of the berries will shrivel up before the Grapes are ripe, and they will never colour, or develop proper flavour. *Planting:* A good planting Vine bought from a nursery in autumn or winter will prove to be from 6 to 10 ft. long, but the whole length should not be retained. After the Vine has been planted the cane should be shortened, and the extent will depend on the height of the glass front; if the Vine is cut back to a point where the starting shoot will have full light directly the bud breaks into growth it will be right. The roots should be covered lightly, and the soil trodden firmly but gently round them. *Pruning and training:* The first year the Vine may reach the top of the house, and while its progress may be regarded as satisfactory in one way, it would not be advisable to retain all the growth which it makes. On the contrary, the rod should be cut back to a third of its length in winter with the object of thickening the lower part. The growth that goes to the top the second year will be much stronger than the first, but if the cane has not thickened well it had better be shortened again by one-half. Any side shoots that push must be pruned close in to basal buds, which it is the habit of Grape Vines to form near the main rod, and from which the next year's lateral shoots push. Deliberation in thus developing the main rod will be rewarded in future years. *Fruiting:* A few bunches of fruit may be taken the second year if the rod is strong, but there should not be anything like a crop until the third year, in which season, if all has gone well with the vine, each lateral may be allowed to bear a bunch. These laterals should be chosen from the best shoots that push on each side of the rod about a foot apart, and should be brought carefully down to the wires and tied at right angles with the rod. When the lateral has made two leaves beyond the bunch of fruit the end should be pinched off, as unlimited extension is undesirable. When the fruit has been gathered each lateral may be cut back to half its length, and further pruned back—this time to the basal bud near the rod—in autumn. *Moisture and ventilation:* Air and water are important considerations from the very first. The Grape Vine loves fresh, pure, but not dry air. A well-managed vinery is a pleasant place to enter, because the air is what gardeners well call "buoyant;" it is light, fresh, and sparkling. The condition is secured by providing plenty of ventilation, keeping the soil moist, and syringing regularly from the time growth starts. Let not the grower be caught napping with his ventilation. If the sun breaks out on a house which is quite closed while he is still abed there may be scorching of leaf and scalding of berry. These troubles are the most likely to happen after a damp spell. *Temperatures:* Artificial heat becomes important in proportion to the amount of forcing which is to be done. If Grapes are wanted in April, enough piping must be provided to maintain a temperature of 50° to 60° in November by artificial means, and 65° to 75° when the Vines come into bloom; this, be it understood, without sun heat. It means, of course, forcing all through the winter. If Grapes are not wanted before July or

FRUIT, GRAPES—*continued.*

August, things are simplified, as the house need not be started before the end of February, and increasing sun heat will help the forcing in spring. It should be noted that the delicious white Grape Muscat of Alexandria needs more heat than the hardier Foster's Seedling and Buckland Sweetwater, or the popular black Grapes, Black Hamburgh and Black Alicante. The air should be kept fairly dry while the Vines are in bloom, in order to favour the spread of the pollen. If the weather is wet and dull at that period, rendering it difficult to get a pleasant flow of buoyant air, it will be well to assist fertilisation by shaking the rods. When the Vines go to rest in autumn reduce fire heat to a minimum; as long as severe frost is kept out of the house they will be safe. *Thinning:* A tedious but necessary task. Without it the bunches become shapeless masses of berries large and small, which ripen irregularly, some not at all. The beginner should call and ask permission to watch a neighbour-



A BUNCH OF GRAPES THINNED.



RENOVATING VINES.

3. Notches made in the strong roots.
4. Fibrous roots pushing.

ing professional. *Troubles:* The real troubles begin when shanking, scalding, scorching, mealy bug, and red spider attack the Vines. If shanking is persistent in young Vines over-cropping may be suspected, and the difficulty tackled by taking fewer large bunches and giving liquid manure while the crop is developing; if in old vines the roots should be examined. Deep-striking ones may be severed, and others raised into fresh soil near the surface. The remedy for scalding and scorching is proper ventilation. Mealy bug is a serious pest, as when it once gets well established it is difficult to dislodge, and may spread to the bunches. An infested house should be thoroughly cleaned in winter, the woodwork being well scrubbed with a solution containing paraffin oil, and the Vines freed of loose bark and scrubbed with an insecticide. Vigorous syringing will help to keep the enemy under. Red spider will not gain a footing if the house is kept moist. Syringing is the best remedy. Wasps sometimes prove destructive, and must be kept out of the house by covering the ventilators with muslin and keeping the door shut. *Varieties:* The two most useful all-round varieties for indoor culture are Black Hamburgh and Foster's Seedling. They are vigorous, relatively hardy, productive, and of good flavour.

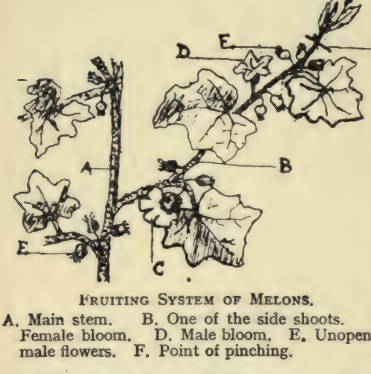
Muscat of Alexandria is superior in flavour, but requires more heat. Gros Maroc is a large Grape of fair flavour. For late use Alicante is the most useful. Other well-known sorts are Alnwick Seedling and Lady Downe's Seedling. Gros Colman is very large, but the flavour is not remarkable, while it is bad to colour. If Grapes are wanted for outdoor culture, Ascot Citronelle and Miller's Burgundy may be chosen. *To keep Grapes:* Grapes can be kept fresh and sweet for a long time if the bunches are cut with a piece of lateral and this is fixed in a bottle of water. The store should be cool, dry, and airy. *Grapes in mixed greenhouses:* It is hardly feasible to grow good Grapes in a general greenhouse unless the plants are restricted to kinds which do not want much heat in winter and can endure shade in summer. If a house is kept warm for plants in winter it starts the Vines too early. It is best to work on plants which spend the summer outdoors and need little heat in winter. The Chrysanthemum is a notable instance.

Loganberry.—A hybrid fruit, raised in America, perhaps by intercrossing a Blackberry and a Raspberry. In Great Britain the Loganberry has been crossed with the Raspberry in the hope of getting a sub-hybrid of the same vigour and cropping power as the Loganberry, but with better flavour. Poor quality is, indeed, the great defect of the Loganberry. It is a tremendous grower, especially in moist clay land or rich loam, making shoots 10 ft. long or more, and nearly an inch thick, in a season. The fruit is much larger than that of either Blackberries or Raspberries, and is borne profusely. It may be stewed, preserved as jam, or canned in syrup. It is for the last purpose that it is now being largely planted. The shoots are trained horizontally or diagonally to horizontal wires, of which there are generally 4 lengths, each a foot above the other, strained on stout posts. The plants should be 12 ft. apart, and the rows may be 7 ft. apart. Plants may be rooted from tips pegged down towards the end of summer, and will bear well in the third year. Three tons to the acre is a satisfactory crop. In private gardens the Loganberry is suitable for planting against arches or pillars. It may be planted in deeply dug and manured soil between November and March inclusive. The clumps should not be allowed to get crowded with old wood, but should be kept thin by pruning out in early autumn shoots which have fruited.

Medlar (Mespilus Germanica).—An unimportant fruit, and one that need only be given space in large gardens. The twisted growth is peculiar and the flowers are not without beauty, so that it may be planted in extensive shrubberies. It will succeed in well-drained loamy soil. Fruit dealers bud their Medlars on to Quince or other stocks. Beyond a little early shaping not much pruning is required. The fruit should be gathered at the end of summer, and stored until it begins to decay. It is then in what is known as the " bletted " stage and ready for use.

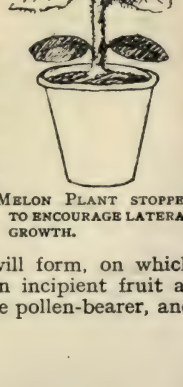
Melon (Cucumis Melo).—A large, juicy, and delicious fruit, grown in practically every large garden and in a good many small ones. It is not a difficult plant to grow, given heat and glass. The French gardeners grow Canteloupe Melons in small frames. Melons are grown in span-roof houses, in pits, and in frames. They thrive

when planted out in mounds of soil made on slates on the stage of a warm span-roof house, the same as Cucumbers; but they need more air and less moisture than Cucumbers, and the soil should be firmer, closer, and less lumpy. The structure must be light, as without sun the flavour will be poor; on this account shade must be avoided. *Propagation :* There is no difficulty in getting a supply of plants from seed, which should be sown singly in small pots in a compost of loam, leaf mould, and sand, in winter or spring, according to when the crop is required.



FRUITING SYSTEM OF MELONS.
A. Main stem. B. One of the side shoots. C. Female bloom. D. Male bloom. E. Unopened male flowers. F. Point of pinching.

Approximately 4 months may be allowed from sowing to cutting, but the time may be longer with spring crops and shorter with summer ones. If the pots can be plunged in bottom heat, or stood in a warm house, germination will be speedy, and the plants may be ready for putting out within the month. When they have rooted freely in the small pots they may be shifted to 5-in., and grown in them until the house is ready for them. The leading shoot must not be stopped, but side shoots should be pinched out. The length to which the plants may go must depend on circumstances, but they are generally in good condition for planting when they are about a foot high and have several rough leaves. If they are grown for frame culture it is well to nip off the tip of the plant when it has made a pair of rough leaves, and so encourage it to push side shoots for training over the hotbed. *House or pit culture :* The structure should be a light, airy one in which a minimum night temperature of 60° can be maintained. The mounds may be made up of loam, with a little decayed manure or leaf mould and some sand, and there should be just enough soil to nicely cover the ball when the plant is turned out of its pot. Top dressings can be given afterwards. The leading shoot may be allowed to go up the roof, where it can be secured to wires strained about a foot below the glass, Side shoots will form, on which two kinds of blossom will show, one with an incipient fruit at the base, the other without. The latter is the pollen-bearer, and



MELON PLANT STOPPED TO ENCOURAGE LATERAL GROWTH.

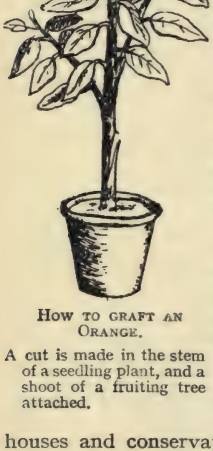
when the pollen is ripe and loose the flower should be picked and pressed into the centre of the fruit-bearer, which, thus impregnated, will begin to swell. Half a dozen fruits may be fertilised on each plant, and it may be done at intervals of 2 or 3 days. The shoots bearing the fruits may be stopped 2 leaves beyond the bunch. While the air should be kept fresh, it should not be saturated with moisture like a Cucumber house. *Frame culture :* To grow Melons successfully in a frame, a hotbed of manure and leaves should be made up after turning the manure 2 or 3 times at intervals to sweeten it; the heap should be well trodden, and a mound of soil put in the centre. The plants will push side shoots as a result of the stopping previously advised, and these can be trained over the bed in different directions, so as to well cover it without crowding. Side shoots may be removed bodily if they push in large numbers and crowd the frame. A close covering, but not a thick pack, of leaves is desirable. When roots show through the mound of soil top dress with fresh warm compost. Give regular attention to watering, never allowing the soil to get dust dry. *Canker* may attack the stems of plants, whether in houses, pits, or frames, if water lodges round the collar. Keep the soil close and concave there. Sulphur and lime may be mixed and rubbed over the affected part. *Varieties :* Imperial Green-flesh is very fine; it is a large, solid, well-flavoured fruit. Hero of Lockinge (white flesh) is smaller, but splendid in flavour, and the same remark applies to Read's Scarlet-flesh. Superlative is a large red-flesh sort. Hero of Lockinge is good for a frame, and so is Blenheim Orange.

Mulberry (Morus nigra).—An interesting old tree, the acid fruit of which is found agreeable by many people. As is well known, the leaves are used for feeding silkworms, and for this purpose the species alba is liked. The Mulberry will thrive in any deep, fertile soil, but does not care for dry, shallow ground. It may be planted in autumn, and propagated by layers, or cuttings of young wood, if increase is desired. It is rarely that the Mulberry is cultivated as a fruit; it is generally planted to form a tree, and the fruit is considered a pleasant side issue. But if cultivated for the fruit, it should be restricted to a limited number of branches and spur pruned. *See* Apples and Pears.

Nut (Corylus Avellana).—The cultivated nuts are much superior to the wild forms, and are well worth growing in gardens where the soil is suitable. They like a rich, friable loam, with limestone below, and do not care for poor dry ground. The Filbert is the most popular, and of this class Lambert's variety is one of the best. Cobs differ slightly from Filberts, but like the same soil and treatment. Nuts require a little study to get the best results, as they produce two distinct forms of flower. One, the nut-bearer, is a small pink blossom with a swelling at the base; the other, the male, is a long yellow " catkin," and bears the pollen, which is ripe and loose late in winter. The female flowers are borne on short side shoots, and pruning should not be done until the pollen has spread, except where the bushes are thick, in which case they should be thinned at any convenient time in winter. The grower need not be afraid to sacrifice a little fruit blossom at this thinning; bushes are never

FRUIT—*continued.*

more productive for being crowded. The system of training is to pinch back a young plant to induce it to push side shoots until about a dozen have been secured that are well placed round the centre, growth and then to let these extend as main branches. No central is taken up. Side shoots push from the main branches, and few or more are retained according to space. Nuts are propagated mainly by suckers and layers. The former, which are basal shoots, are drawn away from the root and planted, the lower buds being removed to leave a clear stem. In the case of layers, young shoots about 2 ft. long are drawn down horizontally and the lower part pegged to the ground. It facilitates rooting if they are partially cut through. When rooted they are transplanted, and the lower buds removed, as in the case of the suckers, leaving, however, sufficient to form the first set of side branches when the head is removed. In forming a plantation for commercial purposes a sheltered place should be chosen, and the trees should be set 12 ft. apart. The nut weevil must be kept in check. It appears in May, and pierces the young nut. When full-fed it turns into a chrysalis and lies buried in the ground throughout the winter. If any weevils are seen, spray with arsenate paste, ½ oz. per gallon of water; or put tarred boards beneath the bushes and shake the weevils off.



HOW TO GRAFT AN ORANGE.

A cut is made in the stem of a seedling plant, and a shoot of a fruiting tree attached.

Orange (Citrus Aurantium).—The Orange is not cultivated for commercial purposes in the northern countries, but it is often grown for ornament, as small plants in pots or tubs look very effective when full of fruit. For this purpose the Otaheite Orange is very suitable. It does not require much heat, in fact mere protection from frost in winter will suffice. It is thus suitable for cool greenhouses and conservatories. A compost of loam, leaf mould, and sand suits it. The habit is naturally compact, so that very little pruning is needed, but the leaves should be sponged occasionally to keep the plant clean and healthy. If seedling Oranges are raised from pips they may be made into good fruiting plants by inarching fruiting branches of the Otaheite Orange. When repotting is necessary it should be done in spring.

Peach and Nectarine (Prunus Persica).—Peaches differ from Nectarines only in having a downy instead of a smooth skin; for cultural purposes the two fruits may be considered as one. They are the most juicy and luscious of all the larger fruits, with the possible exception of the Pear. They are not, however, so hardy as their relatives the Plum and the Cherry. Partly from this cause, and partly because they lend themselves so well to flat training, they are almost exclusively grown against walls, but in the com-

paratively few places where orchard-house cultivation is practised they are often included in the collection of pot trees and grown as open bushes. In the old days Peaches and Nectarines were generally grown outside, but they are now given glass in most places, if only in the form of what is technically known as a "case"—that is, a narrow corridor-like structure. It may be that with the greater prevalence of glass houses the modern school of gardeners does not fully learn the art of Peach culture in the open air; be that as it may, failures are common, and it becomes more and more the rule to grow this delicious fruit under cover. *Outdoor culture :* It must not be assumed, however, that Peaches and Nectarines cannot be grown satisfactorily in the open air. Some gardeners are conspicuously successful with them, especially in the south of England. The most important matters are shelter, care in the early stages of training, and freedom from insects and fungi. The Peach is an early grower and bloomer, and its foliage is delicate. If exposed to cold spring winds the sap is checked, and a terrible disease called blister attacks the trees, which are seriously retarded, or even killed outright. The blister, which appears in the form of large swellings on the leaves, and causes them to shrivel and fall, is the work of a fungus called Exoascus deformans. Bordeaux Mixture (*see* Bordeaux) is a good preventive, if sprayed on as soon as the leaves unfold, but it is desirable to avoid the attack if possible by providing shelter. Where possible the Peaches should be grown on the inner face of kitchen-garden walls. Blister may appear on indoor Peaches if the ventilators are left open when a cold wind is blowing from a quarter which causes it to cut through them on to the trees. Outdoor Peaches are sometimes crippled by black fly, which establishes itself in force on the young shoots and sucks out the life-giving sap. This pest must be kept under or the trees will be spoiled. It can be destroyed by syringing with a solution of paraffin oil and water, or with almost any of the proprietary washes offered by florists and seedsmen. A mistake often made with outdoor (and sometimes indoor) Peaches is to plant them in rich, loose soil, and provide no restriction of the luxuriant growth that follows. The result is that the wood made in the summer runs 4 or 5 ft., and is as thick as a walking-cane; in 2 or 3 years the base of the wall is nearly bare, and the tree bears fruit only on the smaller wood on the upper part of the wall. Ordinary kitchen-garden soil is generally rich enough for Peaches, as they are naturally vigorous growers, and more often need curbing than accelerating. In any case, half a barrow-load of manure is likely to be enough for each tree. Wood ashes and lime rubble are suitable materials. It is wise to start with a two- or three-year-old tree and shorten the branches back to one-third of their length. The following year prune to half the length of the branches. This insures the lower part of the wall being well furnished with wood. The growths then secured will form the skeleton of the tree, and should be fastened in quite clear of each other, so as to admit of young fruiting side shoots being laid in between them. There should be no crossing of shoots, and no shoot must be allowed to grow out from the face of the wall; all that spring from the front of the branches should be cut clean out.

FRUIT, PEACHES—*continued.*

Planting may be done from November to March inclusive. It is an excellent plan to fix a wooden coping about a foot wide just below the top of the wall above the trees. It serves as a protection, and in spring, when the trees are in bloom, light canvas (tiffany or scrim), or even tanned fish netting, may be fixed to it and allowed to hang down in front of the trees on frosty nights. *Peaches under glass—Training:* Peaches and Nectarines are sometimes grown on walls under glass, and sometimes on wire frames fixed under the roof of a lean-to house. With a wide house against a high, strong wall both methods of training may be adopted. In each case a flat, fan-shaped tree is used. Little heat is required, unless early fruit is wanted, and a flow and return 4-in. pipe will suffice. For the roof, the trees will be planted near the front, that is, at the lowest part, of the house; and the branches will follow the rise of the roof a foot below, where wires will be strained for the shoots to be tied to. In the case of the back wall the trees will, of course, be planted against it, and the shoots attached to wires fastened to it, or secured by shreds and nails. The fan system will be adopted. Early pruning will be desirable, as in the case of outdoor trees, if they are bought quite young. It is easy to get older trees, already in an advanced stage of training, and ready to give fruit the first year, but the cost will be rather high. Unfortunately, some people spoil good trees by neglecting to train up new wood from the base when the older branches get bare near the base, yet the work is simple if taken in hand at the proper time. *Soil and planting:* If decayed turf is available no manure need be used, even should the natural soil be poor, for a barrow-load of good loam for each tree will contain all the nutriment which it requires. But half a bushel of wood ashes and a quart of broken bones may be mixed with the loam. In planting, the subsoil should be loosened, some of the decayed turf spread on it in a lumpy state, the tree set in position, the roots covered, and the top soil trodden well round them. Planting may be done up to the time the buds begin to swell. *Pruning:* When the necessary amount of wood to form the framework of the tree has been secured by early shortening, the grower may proceed to fill in with fruiting wood. The best placed of the summer shoots should be chosen for this purpose. If the tree is healthy more will push than are needed, and a selection should be made among them, cutting away the front shoots first, and retaining such of the others as are well placed for tying in between the main branches without crowding. These young shoots may be neatly laid in when the leaf falls, and will bear fruit the following year. They will also push side shoots of their own, but these must be gradually pinched out while small, with the exception of one at the base and one near the top. The former may be allowed to extend unchecked, because it will provide a fruiting shoot for the following year; but the latter may be stopped at the second leaf. *Watering and syringing:* Peaches soon suffer from dryness, either at the root or in the atmosphere. If the air gets very parched, red spider may attack the trees. If the soil is kept moist throughout the growing

season, and the house is syringed daily during sunny weather, there will be no trouble on this score. *Temperatures :* Low temperatures should be the rule to start with; 45° (night) to 55° (day) will do at first; when the fruit has stoned and is swelling, another 10° may be given. The sun will aid more and more as the spring advances, and as it gains power the ventilation must be increased. If early spring forcing is to be carried on, 6 months must be allowed from starting to gathering the crop: thus to have fruit in June a start must be made towards the end of December. *Propagation :* Peaches are largely budded on the St. Julien stock, but the work is almost exclusively carried on in nurseries. Seedling stocks raised from stones can be budded in summer or grafted in spring like other fruits (*see* Apples). *Varieties :* Selections may be made according as early, midseason, and late varieties are wanted. The following are good in their classes; (P) indicates a Peach and (N) a Nectarine:—

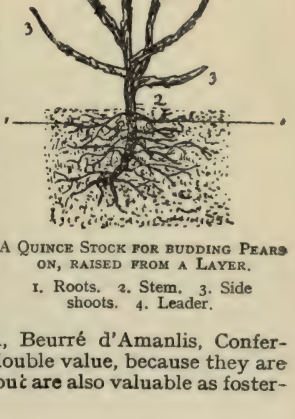
Early.
Cardinal (N)
Early Rivers (N)
Hale's Early (P)

Midseason.
Early Grosse Mignonne (P)
Dymond (P)
Lord Napier (N)

Late.
Barrington (P)
Walburton Admirable (P)
Sea Eagle (P)

The following are suitable for outdoor culture: Hale's Early, Dymond, Sea Eagle, and Salwey.

Pear (Pyrus communis).—A delicious fruit, well suited according to variety either for dessert or stewing, and admirable for bottling. Pears are not largely grown as orchard trees, but in some districts they thrive. They are excellent as neat pyramids at the side of walls, and may be grown successfully as fans and cordons on walls. Fruit lovers often grow a collection of choice dessert Pears as cordons in preference to a small number of pyramids, in order to get the benefit of a succession of fruit, which can be got easily by making a suitable choice of varieties. *Soil and site :* The remarks made under Apple and Fruit apply to Pears. They are at their best on a strong loam. *Stocks :* The best stock for garden Pears is the Quince, but amateurs will be well advised to leave propagation to the trade experts, because many varieties have to be "double-worked," that is, budded on another variety which is itself budded on the Quince. Bergamotte Esperen, Beurré d'Amanlis, Conference, and Oliver de Serres are Pears of double value, because they are not only worth growing for their fruit, but are also valuable as foster-



A Quince Stock for budding Pears on, raised from a Layer.
1. Roots. 2. Stem. 3. Side shoots. 4. Leader.

FRUIT—*continued.*

mothers for more delicate Pears that do not take kindly to the Quince stock directly, but do so when one of the foregoing varieties intervenes. Knight's Monarch, Marie Benoist, Marie Louise, Passe Crasanne, Thompson's, and Souvenir du Congrès may be indicated as delicious Pears that only develop their best quality when double-worked. *Planting and pruning:* The remarks made under Apple and Fruit apply. *Insects and diseases:* The remarks under Apple apply, but a word may be said as to scale, which often fastens on the bark in large quantities. The lime spray tends to reduce it, or the following special spray may be used in winter: 1 gallon paraffin oil, 5 lb. soft soap, 25 gallons water. *Varieties:* There is an enormous number of varieties, from which the following may be selected: (1) Jargonelle, (2) Williams's Bon Chrêtien, (3) Dr. Jules Guyot, (4) Hessle, (5) Souvenir du Congrès, (6) Fondante de Thirriott, (7) Beurré Hardy, (8) Emile d'Heyst, (9) Conference, (10) Louise Bonne of Jersey, (11) Magnate, (12) Marguerite Marillat, (13) Fondante d'Automne, (14) Beurré Clairgeau, (15) Knight's Monarch, (16) Beurré Diel, (17) Beurré Rance, (18) Beurré d'Amanlis, (19) Doyenné du Comice, (20) Marie Louise, (21) Pitmaston Duchess, (22) Thompson's, (23) Passe Crasanne, (24) Beurré Superfin, (25) Bergamotte Esperen, (26) Josephine de Malines, (27) Winter Nelis, (28) Glou Morçeau, (29) Easter Beurré. The list begins with earlies and ends with lates. Nos. 2, 3, 5, 7, 8, 9, 10, 19, 20, 24, 27, and 28 would make a good selection of twelve. Those who make a point of flavour should procure Nos. 7, 12, 13, 17, 19, 20, 22, 24, and 26. Two fine stewing Pears are Catillac and Uvedale's St. Germains.

Plum (Prunus communis).—The Plum is the most important of the fruits which form "stones" instead of pips, and in some districts, notably Pershore, Evesham, and Maidstone, hundreds of acres are grown for market. The Plum loves a strong loam. A certain amount of lime in the soil benefits it, but it is not at its best on shallow limestone soil, which is really not fertile enough for any class of fruit tree. Three or four feet depth of good loam, with limestone underneath it, will grow Plums to perfection if the site is suitable. It must be remembered that in common with the other stone fruits, Apricots, Cherries, Peaches, and Nectarines, the Plum flowers earlier than Apples and Pears, and is liable to suffer severely from frost on a low site. The remarks under Fruit as to manuring, planting, and staking apply to Plums. They are generally worked on to Brompton and Mussel stocks, although several others are used for particular varieties by the trade experts. They are grown as standards, half-standards, bushes, and fans, more rarely as cordons and espaliers. *Pruning:* After the early pruning to form heads referred to under Apple and Fruit, Plums do not require much pruning as standards, half-standards, and bushes, because the quantity of summer shoots which they produce is much smaller, as a rule, than in the case of Apples and Pears; on the other hand, the quantity of fruit spurs and stubby shoots which naturally develop fruit buds is much greater. Where there is a good deal of summer growth, summer pruning will be beneficial.

Enemies : The Plum is not addicted to canker, scab, spot, American blight, codlin grub, and blossom weevil like the Apple, but it is attacked by caterpillars, aphides, "silver leaf," and gum. Caterpillars are best checked by grease-banding in autumn, and if that does not suffice by spraying in spring (*see* Apple). Lime-spraying will check aphides. Silver leaf is a comparatively new but insidious and dangerous enemy, which gets quite into the system of the tree and causes the leaves to assume a grey, shiny appearance. If the disease puts in an appearance, an endeavour should be made to check it by promptly cutting out the affected part and burning it, even destroying a whole tree in case of emergency. No other stone fruit should be planted on the same spot. *Varieties :* The following are good cooking Plums, suitable for market culture, in order of ripening: (1) Rivers' Prolific, (2) Morocco, (3) Czar, (4) Heron, (5) Victoria, (6) Pond's Seedling, (7) Monarch, (8) President. Belle de Louvain, White Magnum Bonum, and Pershore are also good Plums. The following are garden varieties of good flavour: Greengage, Early Transparent, Late Transparent, Bryanston Gage, Jefferson's Gage, and Coe's Golden Drop.

Quince (Pyrus Cydonia).—A highly aromatic fruit, colouring bright yellow when ripe, and useful for jelly. The tree is of rather straggly habit, but the root system is shallow and fibrous, thus rendering it valuable as a stock (*see* Pears). The Quince will thrive in well-drained loamy soil. It is propagated by cuttings and layers, principally the latter. There are several ornamental varieties, and one, Japonica, the Japanese Quince, is much planted as a shrub for walls on account of the profusion of large and brilliant flowers with which it clothes itself in spring. The variety Maulei is also fine.



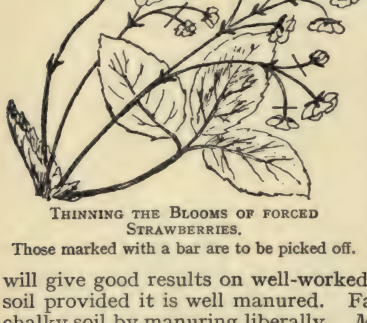
Training Raspberries on Wire.

Raspberry (Rubus Idaeus).—The Raspberry is an esteemed fruit, alike for cooking and preserving, and fortunately it can be grown successfully in all but the poorest soils. It does not like dry, hot ground, however. Its nature is to spread at the root by underground suckers near the surface, and to throw up long, slender shoots bearing leaves; these shoots produce small fruiting clusters the following year—sometimes the same year, but that is not desirable except where late fruit is wanted. It will be gathered that the way to get heavy crops of Raspberries is to manage them so as to secure an annual succession of good fruiting canes. There is no difficulty about this. If young suckers are taken from the old stools in autumn, planted in deeply tilled, well-manured soil, either a foot apart in a row to be tied to a horizontal wire a yard high, or in clusters of 3 or 5 to form a

FRUIT—*continued.*

clump and be supported by a strong stake, and are then cut back to within 6 ins. of the ground, they will quickly become established. The fruiters of the one year may be pruned away after bearing, and give place to the young shoots which will be the fruiters of the following year. The annual digging should be shallow. Top dressings of manure will sustain vigour and fruitfulness. A weevil sometimes attacks Raspberries, and should be shaken off on to tarred boards at night while feeding. The following are good varieties: Superlative, Hornet, October Red (the last for autumn bearing).

Strawberry (Fragaria).—This delicious fruit occupies an almost unique position, inasmuch as it can be fruited within a year of the formation of the plant, and may therefore be brought within the cropping scheme of a kitchen garden if desired. Taking up little room, it is suitable for culture in the smallest gardens; and a bed of Strawberries might very well take the place of the coarse vegetables which are often allowed to occupy far more space than their merits deserve in little places. *Soil :* Strawberries will grow in most soils, heavy or light. They like a friable, fertile loam, but they will give good results on well-worked clay, and also on light, sandy soil provided it is well manured. Fair crops can be got from thin, chalky soil by manuring liberally. *Manure :* Two barrow-loads per rod or 30 cartloads per acre of decayed yard manure, supplemented by 6 lb. or 8 cwt. as the case may be of artificial, will give heavy crops. The artificial may consist of 3 parts kainit, 2 of superphosphate (or the same quantity of basic slag on limeless soil), and 1 of nitrolim, provided it is turned well in, but kainit must not be spread externally on a bed of young Strawberries, or it will kill the plants. *Planting :* May be done from September to May inclusive—in fact, if young pot plants are used they could be put in during summer if desired. Most fruit dealers strike Strawberries in small pots in order to be able to execute orders at periods when it would not be safe to lift plants from the open. Early autumn is a good time to plant. The rows may be made 30 ins. apart, and the plants set 18 ins. apart in the rows. Spring Onions, early Lettuces, or some other quickly cleared crop may be put between the rows the first spring. *Propagation :* Those who wish to raise their own plants should fill a number of 3-in. pots firmly with light, loamy soil in July, set the first plantlets which form on the runners on the soil, and keep them in position with a stone or peg. In about 6 weeks they will have rooted freely, and may be cut away from the runner and planted. But plants should not be allowed to form any runners



THINNING THE BLOOMS OF FORCED STRAWBERRIES.
Those marked with a bar are to be picked off.

the first year. *Fruiting:* Strong young plants are quite likely to bear some fruit the first year—that is, the summer after being struck. Long, clean straw should be spread between the rows when they come into bloom, partly to protect the flowers against a late frost, but mainly to prevent the fruit from being soiled in wet weather. If the straw is removed at the end of summer, the weeds cleared off, runners cut away, and the soil stirred, the plants will bear a splendid crop the second year. Thereafter the cropping will turn upon the treatment. If the beds are well dressed annually and are given liquid manure in summer, with artificial manure in the form of sulphate of potash and superphosphate between the rows in February, they will yield good crops for several years. On the other hand, if the beds are allowed to get crowded, and are not properly cleaned and manured, the fruit soon becomes small. A few plants in most beds fail to bloom, and they should be destroyed, as if left runners may be taken from them inadvertently, and the stock of barren plants increased. *Forcing:* Those who want Strawberries in spring should either buy plants ready prepared for the purpose, or shift home-raised plants from small into 6-in. pots in September, using loamy soil with a dash of leaf mould and sand. The plants will make a nice plump fruiting crown before winter. They can be put into a gently heated house in January or later. A temperature of 55° to 65° will be better than a very high one. A place near the glass is desirable, otherwise the flower stems will run up weakly and the fruit be poor. A dozen fruits will be enough to each plant. Water and weak liquid manure should be given while the crop is swelling. *Mildew:* Strawberries are much subject to mildew, which often whitens the foliage completely. The best remedy is liver of sulphur, which, however, is only effectual when the crystals are kept perfectly fresh up to the time of use in a sealed receptacle. Half an ounce per gallon of water will suffice. The liquid thus made is green, and has an offensive smell. It must be used at the first stage of attack. *Varieties:* For earliness, productiveness, and good flavour combined there is no Strawberry superior to Royal Sovereign. Other good all-rounders are Sir Joseph Paxton, Reward, and Bedford Champion. One of the best late sorts is Givon's Late Prolific. Royal Sovereign and Sir Joseph Paxton are the two most important market varieties, but Bedford Champion and Trafalgar are gaining favour. Those who want to make Strawberry jam in quantity should grow the little variety Grove End Scarlet, as it keeps its shape well. The same remark applies to Vicomtesse Hericart de Thury. *Perpetual Strawberries:* The non-professional who reads of Strawberries that give large crops every month in the year should remain sceptical, but he may, if he likes, try a few rows of Laxton's Perpetual or St. Joseph, as these small-fruited varieties certainly bear successional crops.

Walnut (Juglans regia).—The Walnut is hardly a fruit for small gardens, but it is ornamental enough to claim a place in a large garden, and also in parks, while the nuts are highly esteemed. It is a hardy tree, and thrives in most soils unless very poor, dry, and shallow. The nuts are thrashed down in their thick coats in early autumn, and stored for use in winter.

Hybrid fruits.—There are several hybrid fruits available now, some of which are dealt with under their own names in this work. The Loganberry is the most important (*see* p. 151). The Strawberry-Raspberry is of no importance, as the flavour is very poor. It is a Japanese plant, a hardy herbaceous perennial, with white, perfumed flowers. The berries are globular and dark in colour, and are borne on the new wood. The reputed origin—a cross between Strawberry and Raspberry—is very doubtful. The Japanese Wineberry is a species (Rubus phoenicolasius), and is a hardy shrub, which bears red fruit in clusters, ripe in summer. It is juicy and sweet and makes a good preserve. The Austen Dewberry is a large form with black fruit of good flavour; it thrives in damp sites. The Mahdi is a hybrid between Raspberry and Blackberry, and bears dark Raspberry-like fruit of good flavour. The Lowberry is also a good hybrid.

Fuchsia (fū-chsia, after Herr Fuchs. Ord. Onagrarieae).—This graceful plant has many admirers. There are few plants more elegant and pleasing, and the culture is not difficult. Bud-dropping is the only serious defect, and that can be avoided with care in watering (*see* Watering). The Fuchsia thrives in a cool greenhouse in summer, and may be grown as a window plant with success if properly watered and ventilated. When pushed on by repotting specimens of great size may be grown, and such plants, 6 or 7 ft. high and laden with flowers, are very beautiful objects; but smaller plants in 5-in. or 6-in. pots are more useful to most gardeners. These may be got by striking cuttings of young shoots about 3 ins. long in sandy compost in spring; they root more surely if covered by a bell-glass. When 6 ins. high the tops may be pinched off, and freely branched plants will follow. A compost of loam 3 parts, leaf mould 1 part, and sand will suit them. With adequate moisture they will grow rapidly, and soon come into bloom. At the end of the season the water supply should be reduced and the plants brought to rest. They can be stored in any dry, frost-proof place for the winter; and in spring can be retarded by being put in a warm house and syringed. They may then be pruned hard back to encourage a fresh lot of shoots from the base. The following are good varieties:—

Single.	*Double.*
Countess of Aberdeen	Avalanche
Loveliness	Ballet Girl
Lye's Excelsior	Miss Lucy Finnis
Rose of Castile	Phenomenal

The hardy species are often used for the garden, and come up year after year, making large bushes in mild districts. In cold places it is well to put some litter over the roots after cutting them down in autumn. The following are good: macrostema gracilis, purplish-red; macrostema Riccartoni, scarlet. The species corymbiflora, scarlet, and its white variety are sometimes grown under glass.

Fumigation.—The burning of tobacco-paper in plant-houses, which is what gardeners understand by fumigation, has largely

given place to vaporisation with cones containing a preparation of nicotine. The cones are sold by seedsmen and florists. One or other should be practised periodically—say once a fortnight—through the growing season.

Fungi, Fungicide.—A fungus is a low vegetable organism devoid of chlorophyll, and deriving its nitrogen and carbon from a host plant, living or dead. There are large numbers of fungi which feed on living plants, and they are called parasites. Those which live on decaying matter are termed saprophytes. Some of these fungi are referred to under the plants which they attack. Bordeaux Mixture (which see) is one of the best of fungicides. Sulphide of potassium is also good. Dry flowers of sulphur destroys mildew. Fostite, Strawsonite, Vermorite, and Woburn Bordeaux paste are good proprietary fungicides. Condy's fluid of a pink colour is safe and good.

Funkia, Plantain Lily (fūn-kia, after Herr Funk. Ord. Liliaceae).—*See* Bulbs.

Furze, Gorse, or **Whin.**—The common Furze is Ulex europaeus. It is a well-known occupant of heathy, sandy wastes, and is in bloom many months of the year. The double-flowered (flore pleno) is particularly good; it may be propagated by cuttings in spring or autumn. Strictus, the Irish Furze, is a variety of europaeus, but is not a free bloomer. Nanus is a dwarf species, blooming in autumn.

Gaillardia (gaillārd-ia, after M. Gaillard. Ord. Compositae).—Annuals and perennials, with rich brown and yellow flowers, borne freely in summer. The annuals are varieties of pulchella picta, and are sold in mixed packets by seedsmen. For culture, *see* Annuals. Lorenziana is a form of picta with tubular florets. The perennial Gaillardias, of which named varieties are becoming known, are hybrids of G. aristata, and are propagated by division or by cuttings in autumn, kept in a frame through the winter. They are handsome plants for the herbaceous border, and are not particular as to soil.

Galanthus, Snowdrop (galān-thus, from *gala,* milk, and *anthos,* flower, referring to the white flowers. Ord. Amaryllideae).—*See* Bulbs.

Galax (gā-lax, from *gala,* milk, referring to the white flowers. Ord. Diapensiaceae).—One member of this genus is grown, and that is aphylla, a pretty hardy rockery plant, attractive both in leaf and bloom. Its white flowers are borne in summer. It likes a very friable soil, such as leaf mould with a fourth of loam and a good deal of grit. Propagation is by division in autumn. *See* the *Botanical Magazine,* t. 754.

Galega, Goat's Rue (galē-ga, from *gala,* milk; formerly supposed to be good for cows. Ord. Leguminosae).—One of our most brilliant and vigorous border plants, thriving anywhere and easily propagated by division between November and April. Both the lilac species officinalis and its white variety alba should be grown. The variegated-leaved may be grown if desired; it becomes green when in full vigour in summer. *See* Flower Garden—Herbaceous plants.

Galtonia.—*See* Hyacinthus candicans and Bulbs.

Gardenia (gardē-nia, after Dr. Garden. Ord. Rubiaceae).—Producing white, strongly scented flowers of neat shape and convenient size, Gardenia florida is a popular plant. It thrives in a warm, moist atmosphere, and does best when planted out; it may, however, be grown in pots, 6-in. and 7-in. being suitable sizes. A compost of loam 3 parts, leaf mould and dried cow manure 1 part each, with sand, suits it. A temperature of 60° to 70° should be provided in winter. Propagation is by cuttings inserted under a bell-glass in bottom heat in spring. There are several varieties of G. florida, of which the double white is the best known. Variegata has yellow-margined leaves. Others are Fortuneana and radicans.

Garlic.—*See* Kitchen Garden.

Garrya (gār-rya, after Mr. Garry. Ord. Cornaceae).—The one species grown to any extent, elliptica, is a hardy evergreen shrub, producing yellow flowers in spring. It is not particular as to soil. Propagation is by cuttings under a bell-glass in September. *See* the *Botanical Register*, t. 1686.

Gaultheria, Wintergreen (Gaulthē-ria, after Dr. Gaulther. Ord. Ericaceae).—One or two members of this small genus are esteemed for the rock garden. They are small evergreen shrubs that thrive in peaty soil and are propagated by layers. Procumbens, the Partridge Berry, has white flowers in July. Shallon has white flowers in spring. *See* the *Botanical Magazine*, t. 2843.

Gazania (gazā-nia, from *gaza*, richness, alluding to the brilliant flowers. Ord. Compositae).—Half-hardy plants suitable for the flower garden in summer. Splendens is the most commonly grown, and it bears orange flowers. Ordinary friable soil suits it, and it may be propagated by cuttings under a bell-glass in summer.

Genista, Broom (genīs-ta, Virgil's name. Ord. Leguminosae).—These are allied to Cytisus. They are easily grown, thriving in most soils, and propagated by cuttings in a frame. Hispanica, the Spanish Broom; tinctoria, the Dyer's Greenweed, and its varieties; and virgata are the principal sorts. *See* Broom and Cytisus.

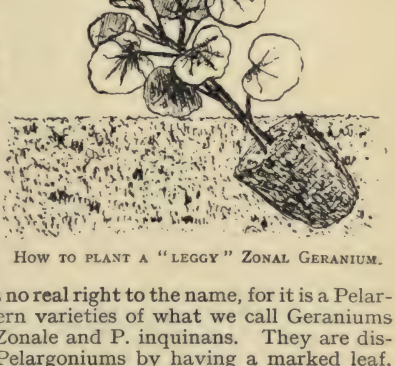
Gentiana, Gentian (gentiā-na, after Gentius, King of Illyria. Ord. Gentianeae).—Among the most valuable of Alpines, on account of their brilliant blue flowers, which are unexcelled for richness of colour. The Alpine species like a peaty soil. They may be raised from seed in a greenhouse in spring, or divided in spring. There are no choicer flowers for rockwork. "Gentian-blue" has become a popular expression to indicate brilliance. The following are the principal Gentians:—

Acaulis, blue, spring, 4 ins. high (*Botanical Magazine*, t. 52).
Andrewsii, blue, summer, 2 ft.
,, alba, white.
asclepiadea, blue, early summer, 1 ft. (*Bot. Mag.*, t. 1078).
,, alba, white.
Bavarica, blue, summer, 3 ins.
lutea, yellow, summer, 2 ft., yields the commercial Gentian.

septemfida, blue, summer, 9 ins. (*Bot. Mag.*, tt. 1229 and 1410).
verna, blue, spring, 3 ins. (*Bot. Mag.*, t. 491).
,, alba, white
Walujewi, pale blue, early summer.

Geonoma (geonō-ma, from *genomos*, skilled, conveying that skill in propagation is required. Ord. Palmae).—Geonoma gracilis is one of the best of room plants, and should be included in any collection of palms grown in small pots. For culture, *see* Palms.

Geranium, Cranesbill (gerā-nium, from *geranos*, a crane, in allusion to the beak-like projection from the seed. Ord. Geraniaceae).—The true Geraniums are hardy herbaceous plants, with bright flowers in summer. They are not particular as to soil, and are easily propagated by division in spring, also by seeds. Such species as argenteum, with light red flowers and silvery leaves; armenum, purple; Endressi, rose; sanguineum, crimson, and its variety Lancastriense, rose striped, are worth growing in every herbaceous border. The Zonal Geranium which we grow as a bedding and ribbon border plant in summer, as a pot plant for both summer and winter, and as a window-box ornament for the warm season, is not a true Geranium. It has no real right to the name, for it is a Pelargonium. Most of the modern varieties of what we call Geraniums derived from Pelargonium Zonale and P. inquinans. They are distinguished from the other Pelargoniums by having a marked leaf, hence the term Zonal; if this is used regularly there is no fear of confusion. The Zonal Geraniums do not hold entire sway in the flower garden now, as they did in years gone by, because borders of hardy herbaceous plants are the vogue; but they are still used largely. A start may be made by buying a stock of young plants about the middle of May, which may be planted 18 ins. apart in well-dug but not heavily manured soil. These will flower continuously through the summer, unless it is very wet. Pick off decaying trusses regularly; fresh ones are thrown up continuously. About mid-August a piece of ground in a sunny spot may be raked over and cuttings of the young shoots, 3 or 4 ins. long, taken off just underneath a joint, divested of their lower leaves, and inserted firmly 2 ins. deep. Or cuttings may be put 4 ins. apart in shallow boxes of sandy soil. They will make very little growth before spring, and it is not desirable that they should. They can be wintered on a shelf in a cool house from which frost is excluded. A few of the old plants may be lifted in November, trimmed root and branch, tied in bundles, and hung in a cool cellar as a reserve. In spring the



How to plant a "leggy" Zonal Geranium.

plants, young or old (but the former preferred), may be potted singly into 3-in. or 4-in., and stood in a frame or pit until the time comes for planting; or some of them may be potted-on for flowering in the greenhouse. To get bloom in a heated house in winter strike cuttings in spring, repot the plants as required until they are in 6-in., pinch once or twice to make them bushy, and pick out the flower buds as fast as they show until November, then let them come into bloom. Loam, with a little leaf mould and some sand, makes a suitable compost. Zonal Geraniums are generally free from insects and diseases, but the foliage will become blotched if the falling petals are allowed to decay on them. The following are good varieties:—

For Bedding.

Beckwith's Pink
Paul Crampel, scarlet
Flower of Spring, silver variegated
Mrs. Pollock, golden variegated
Mr. Henry Cox, dark variegated

Singles for Pots.

Carmania, salmon-rose
Hatfield, pink
Lady Warwick, Picotee edge
Saxonia, scarlet
Sir T. Hanbury, blush
Venus, white

Doubles for Pots.

Colossus, crimson
Californie, orange
Rosa Bonheur, pink
Pierre Loti, rose
King of Denmark, salmon
Raspail Improved, scarlet
Hermione, white

Gerbera, Barberton Daisy (gēr-bera, after Herr Gerber. Ord. Compositae).—The beautiful Gerbera Jamesoni is quite a modern plant in European gardens, having being introduced from South Africa in 1889 (*see* the *Botanical Magazine*, t. 7087). It arrested instant attention, with its large, starry, brilliant scarlet flowers, and being taken in hand promptly by the hybridists, soon gave different colours. There is now quite a range of hues. The plant is not quite hardy, and if grown outdoors should have a sheltered place. It is perhaps best treated as a pot plant, being grown in a frame or cool greenhouse. A sandy compost of loam and peat in equal parts suits it. Seed is procurable, and may be sown in pans of sandy soil in a warm frame or greenhouse in spring, the seedlings being pricked off, potted singly, and repotted as desired. Five-inch pots are large enough, and the soil may consist of loam with a third of leaf mould and some sand. If growths from the base can be secured they may be used as cuttings. The plants come readily from seed sown in a greenhouse in spring, the seedlings pricked off, potted singly, and repotted as needed.

Gesnera (gesnē-ra, after Conrad Gesner. Ord. Gesneraceae).—Very brilliant warm-house plants, with large, rough leaves and tubular flowers borne loosely on long stems. The flowers are mostly both abundant and brilliant, so that the plants are very showy. They are suitable for pots or baskets. The tubers should be started in bottom heat in February, and potted in a compost of loam 3 parts, leaf mould and dried cow manure 1 part each, and sand. They may be flowered in 6-in. pots. Give a warm house and plenty of moisture until they come into bloom, when they may go

into a cooler house. Dry them off after flowering. Cardinalis, scarlet and white; maculata, purple, spotted; and refulgens, violet and white, are good.

Geum, Avens (gē-um, from *geyo*, to stimulate, owing to the properties of the root. Ord. Rosaceae).—Brilliant orange-flowered hardy herbaceous plants, blooming in spring and early summer. Thriving in almost any soil, and flowering early and long, they are very useful. For culture, *see* Flower Garden—Herbaceous plants. Chiloense (coccineum), scarlet (*Botanical Register*, t. 1088), and its variety miniatum; and montanum, yellow, with its varieties, are most grown.

Gilia (gīl-ia, after Señor Gilio. Ord. Polemoniaceae).—The most popular members of this small genus are the hardy annuals tricolor and alba, which grow about a foot high and bloom in summer; but there is a much finer plant in the old species coronopifolia, which grows about 30 ins. high and produces beautiful rosy flowers in summer. It is best treated as a biennial (*see* Biennials). Tricolor is illustrated in the *Botanical Magazine*, t. 3463.

Gillenia (gillē-nia, after Gillenius. Ord. Rosaceae).—A small genus of hardy herbaceous plants, only one of which, trifoliata, is much grown. For culture, *see* Flower Garden—Herbaceous plants. It produces red and white flowers in July and grows 3 ft. high. *See* the *Botanical Magazine*, t. 489.

Gilliflower.—The old name for Carnations, Wallflowers, and Stocks. It was spelt in various ways, including Gillyflower, Gilofre, and Gillivor. It probably originated from caryophyllus, the name of the Indian clove tree, Caryophyllus aromaticus, because of the clove scent.

Ginkgo, Maidenhair Tree (Gīnk-go, the Japanese name. Ord. Coniferae).—Ginkgo biloba is one of the most distinct of Conifers, its foliage resembling that of the Maidenhair Fern. It does not grow rapidly, and may therefore be used as a lawn tree in small gardens. It thrives near towns, and will grow in any well-drained fertile soil. It may be planted in autumn or spring. Propagation is by seeds sown in heat in spring. There are several garden forms of it, such as laciniata, fastigiata, and pyramidalis.

Gladiolus (gladī-olus, from *gladius*, a sword, referring to the shape of the leaves. Ord. Irideae).—*See* Bulbs.

Glastonbury Thorn.—*See* Crataegus.

Glaucium, Horned Poppy (glāū-cium, from *glaukos*, grey-green, in allusion to the colour of the leaves. Ord. Papaveraceae).—A small genus of Poppies, the most familiar of which is luteum, the yellow Horned Poppy; it bears large yellow flowers in summer. It may be raised from seed in spring, and does not require special soil.

Glaucous, greyish-green.

Gleichenia (gleichē-nia, after Herr Gleichen. Ord. Filices).—A small genus of ferns requiring a warm house. They form creeping rhizomes on the surface of the soil. Peat, with broken sandstone,

forms a good compost. Propagation is by division in spring, or spores. Circinata, flabellata, and rupestris are the principal species. There are several varieties of each.

Globe Amaranth.—*See* Gomphrena.

Globe Flower.—*See* Trollius.

Globe Thistle.—*See* Echinops.

Gloriosa (gloriō-sa, from *gloriosus*, glorious, in reference to the beautiful flowers. Ord. Liliaceae).—Gloriosa superba is a brilliant hothouse twiner, with long orange and yellow flowers which are curiously contorted. It should be repotted, when required, in January; but that is only when the pots get very crowded. The opportunity should be taken of removing some of the offsets for fresh stock. It likes plenty of moisture in summer, but none in winter. Peat and loam in equal parts, with sand, suit. The variety grandiflora is shown in the *Botanical Magazine*, t. 5216.

Glory Pea.—*See* Clianthus.

Gloxinia (gloxīn-ia, after P. B. Gloxin. Ord. Gesneraceae).—The Gloxinia is one of the most beautiful of all tuberous-rooted plants, for it produces broad, handsome leaves and abundance of large, bell-shaped flowers. It is very easy to grow, and therefore takes rank as one of the best plants for amateurs. Heat is required in the early stages of growth, but when the plants come into bloom they are best in a cool house, where the flowers last well. The old type had drooping flowers, but the modern class has erect ones. Gloxinias may be raised from seed in winter in the same way as tuberous Begonias, and good plants can be flowered in less than 6 months. By using or withholding heat for different batches a succession of bloom can be had. Those who do not wish to raise plants from seed every year may store the tubers in winter like those of Begonias and restart them in spring. Loam, with a fourth each of leaf mould and decayed manure and some sand, is suitable. Propagation may also be effected by leaves, either inserting the leaf stalk in sandy soil, or nicking the midrib and laying it in the soil. The tubers may be divided in spring. The species of Gloxinias are rarely grown in gardens nowadays, attention being devoted to the florists' varieties.

Goat's Beard, Spiraea aruncus.

Goat's Rue, Galega.

Godetia (godē-tia, after M. Godet. Ord. Onagrarieae).—Beautiful hardy annuals, remarkable for their profusion of large, brilliant flowers and late flowering. For culture, *see* Annuals—Hardy. The following are good varieties: Dwarf Pink, Double Rose, Schaminii flore pleno, double pink; Lady Albemarle, carmine; and Duchess of Albany, white. Botanists refer the genus to Oenothera.

Golden Chain.—*See* Laburnum.

Golden Feather.—This once popular plant is the Chrysanthemum Parthenium (formerly Pyrethrum parthenifolium aureum) of the botanists. For culture, *see* Chrysanthemum.

Golden Rod.—This graceful, late-blooming, hardy herbaceous perennial is the Solidago virg-aurea (solidā-go, from *solidare*, to unite, in reference to the healing properties. Ord. Compositae) of the botanists. It will thrive in almost any soil, but does best on cool, moist peat, where it becomes a noble object. There are several forms, but the common serves when well grown. It is easily propagated by division.

Gold Fern.—*See* Gymnogramme.

Goldilocks.—Chrysocoma (or Aster) Linosyris.

Gold Thread, Coptis trifoliata.

Gomphrena, Globe Amaranth (gomphrē-na, from *gomphos*, a club, referring to the form of the flowers. Ord. Amarantaceae).—Pretty half-hardy annuals, well adapted for cool greenhouses in summer. The popular species is globosa, which has small roundish red flowers, like little crimson balls. There are several varieties, and in all the flowers are so persistent as to be suitable for use as "everlastings." They are easily raised from seed under glass in spring, and are not particular as to soil. *See* Annuals—Half-hardy.

Good King Henry or **Mercury** (Chenopodium).—*See* Kitchen Garden.

Goodyera (goodyē-ra, after Mr. J. Goodyer. Ord. Orchidaceae).—Tuberous-rooted terrestrial Orchids, thriving in peat with a fourth of leaf mould, and propagated by young shoots with a portion of tuber. They are grown for their beautifully marked leaves. Discolor, pubescens, and velutina, are the principal species. Pubescens (*Botanical Magazine*, t. 2540) is hardy; the others require a warm house.

Gooseberry.—*See* Fruit.

Gorse.—*See* Furze.

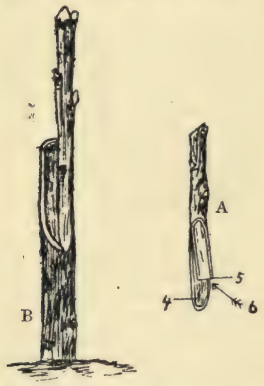
Gourd, Cucurbita (cucūr-bita, from *curbita*, a gourd. Ord. Cucurbitaceae).—A very large class, bearing fruits of different shapes and colours. They may all be grown as half-hardy annuals the same as Vegetable Marrows (*see* Kitchen Garden). They are suitable for growing against pillars and over arches. The following are a few of the most popular kinds:—

Egg-shaped	Summer Crookneck
Hubbard Squash	Turk's Cap
Ohio Squash	Yokohama

Grafting.—The process of grafting is an interesting and useful one. By its means a variety may be changed, a "stock" converted into a fruit tree, and a Brier into a Rose. Budding (*see* Fruit and Roses) is a form of grafting which is done in summer, when the plants are in full growth. Outdoor grafting is best done in spring, when the sap is beginning to flow strongly. Indoor grafting, which is practised with Roses, Clematises, and other popular plants, is generally done in winter in a warm house.

Outdoor grafting.—This is generally limited to fruit trees. If a variety is unsatisfactory, a stronger one can be grafted on to it.

This is done by taking a few shoots of the chosen variety while dormant in winter, and putting them in a cool, shady place, then, when the sap moves in the trees (an action which can be told by a slight change in the buds), the tops are shortened to stumps, and the grafts cut up into pieces about the size of a Turkish cigarette, each with 4 dormant buds. The lower inch is sliced down wedge-shaped, tapering to a point at the base. The stumps are now dealt with: a slit the length of the wedge-shaped slice is cut in the two sides, and the edges of the bark gently raised; the graft is slipped in and tied securely with raphia. To further the chances of union,



WHIP OR TONGUE GRAFTING.
A. Scion prepared. 4. First cut. 5. Second cut. 6. Point of raising the tongue.
B. Scion inserted in stock cut with a tongue to receive it.



GRAFTING FRUIT TREES.
Whip or tongue grafting. First cut. See also A, B, in accompanying figures.

paint all over the cut part some melted "composition wax" candle; or the following, melted together in a pot over a fire: 6 parts resin, 2 beeswax, 1 tallow. The wax will exclude the air. Some grafters gain the same end by plastering a compound of cow manure, horse manure, and loam in a large cone round the graft. When the grafts begin to grow it is a good plan to tie flower sticks to the clumps and attach the grafts to the sticks, as a safeguard against their being blown out; but this is not necessary in shady places. They should be in active growth within a month. The process is called "crown" grafting. Where young Paradise, Crab, Quince, or other stocks are being dealt with, a different system is necessary. As a rule, nurserymen first bud such stocks, and the process is the same as budding Roses. One bud is inserted in the stem of each stock a few inches above the ground. If it remains fresh the shoot grows the following spring; but should it fail the top of the stock is taken off about 6 ins. from the ground and grafted. Here "whip" ("tongue") grafting is performed. A slice is made upwards in the stock, and half way along the cut face a cut is made downwards. The graft is

also prepared with a slice and a cut (upward and downward in this case, however), the two are fitted together, tied, and waxed.

Indoor grafting.—This is the work of expert propagators in nurseries, and is rarely done outside the trade establishments. The process adopted is generally called "saddle" grafting. The stock is cut upwards on two sides, forming a ridge, and the graft is slit up the centre so that it can be pressed gently on to the ridge or saddle and tied. Bottom heat is desirable.

Grape.—*See* Fruit.

Grape Hyacinth.—*See* Bulbs—Hyacinth.

Grass.—*See* Flower Garden and Lawn.

Grasses, Ornamental.—*See* Annuals.

Green Fly.—*See* Aphides.

Greenhouse.—With the aid of a greenhouse, heated or unheated, many plants may be grown which have to be omitted where there is no glass, and flowers can be produced at periods of the year when they would have to be procured by purchase or done without if there was no plant structure available. Greenhouses, therefore, are a useful auxiliary to the garden. At the same time, they entail additional expense and responsibility, and these things should be considered. Greenhouses are of many shapes and sizes, and they are devoted to various purposes; but in large establishments, where there are several different glass structures, "greenhouse" has a specific meaning. It is not a "stove," an "intermediate house," a "pit," or a "conservatory;" it is "the greenhouse"—a mildly heated house, used mainly for bringing on young plants which are to be flowered in a conservatory. With amateurs of limited means, however, the greenhouse is a general structure, in which all kinds of plants are grown, and which is used for flowering mature plants as well as bringing on young ones.

Forms of greenhouse.—A greenhouse may have a single roof, leaning against a wall or other support; or it may have a "span" roof, each side supporting the other against a ridge-board. Against a low wall it may rise, make a short dip, and rise again to the wall, forming a "hip." A plain span or lean-to is better than a compound structure for amateurs.

Materials.—The greenhouse should consist of well-seasoned timber, painted 4 coats, and glazed with 21-oz. glass without putty. It should be well supplied with ventilators. In a span roof there should be at least one ventilator on each side. If the structure is to be movable it should be made in sections to rest on loose bricks, and fixed to the wall with screws turned into blocks. In the case of a freehold owner the house may rest on mortared brick walls.

Urban building laws.—In districts where urban building laws apply, a person may not erect a greenhouse of any kind before submitting plans to the corporation, district council, or other authority.

Unheated greenhouses.—It will not be possible to get bloom all the year round from an unheated house by growing the ordinary

GREENHOUSE—*continued.*

pot plants, but by using bulbs and some garden plants as well there will generally be flowers. The following are available:—

Plants raised from Seed.

Various half-hardy annuals (*see* Annuals)
Auriculas, also offsets (*see* Auricula)
Carnations, Marguerite and Grenadin (*see* Carnation)
Primroses and Polyanthuses (*see* Flower Garden)
Sweet Peas (*see* Sweet Peas)
Various Alpine plants (*see* Flower Garden)

Plants from Bulbs, Tubers, or Offsets (for particulars, see *Bulbs).*

Arum Lilies
Cannas (*see* Canna)
Daffodils
Freesias
Gladioli
Hyacinths
Irises
Liliums
Tulips

Plants from Cuttings.

Azaleas (*see* Azalea)
Camellias (*see* Camellia)
Chrysanthemums (*see* Chrysanthemum)
Geraniums, Zonal (*see* Geranium, Zonal)
Roses, also from buds (*see* Roses)
Violets, also divisions and runners (*see* Violets)

Plants propagated by Division.

Christmas Roses (*see* Bulbs)
Deutzia gracilis (*see* Deutzia)
Dielytra spectabilis (*see* Bulbs)
Spiraea Japonica (*see* Spiraea)

The Auriculas, Primroses, Polyanthuses, Alpine plants, Arum Lilies, various early bulbs, and Violets will bloom in mild spells during the winter, or in early spring. The bulk of the bulbs will flower in spring, followed or accompanied by the Azaleas and Camellias. The Carnations, various annuals, Deutzia, Dielytra, Spiraea, Sweet Peas, Cannas, Gladioli, Liliums, Geraniums, and Roses will bloom in summer. The Chrysanthemums, Zonal Geraniums, and Christmas Roses will bloom in autumn and early winter.

Cool greenhouses.—A "cool" greenhouse is one in which the temperature ranges from 45° to 50° in winter, not falling below the former figure even in very cold weather. The following plants may be grown in it:—

Plants from Seeds.

Abutilon (*see* Abutilon)
Acroclinium (*see* Annuals)
Alonsoa (*see* Alonsoa)
Balsam (*see* Annuals)
Begonia (*see* Begonia)
Calceolaria, herbaceous (*see* Calceolaria)
Campanula pyramidalis (*see* Biennials)
Carnations (*see* Carnation)
Celosias (*see* Annuals)

Plants from Seeds—continued.

Cinerarias (*see* Cineraria)
Coleuses (*see* Coleus)
Cyclamen (*see* Bulbs)
Diascia (*see* Annuals)
Francoas (*see* Francoa)
Gerberas (*see* Gerbera)
Gloxinias (*see* Gloxinia)
Grevillea robusta (*see* Grevillea)
Humea elegans (*see* Humea)
Mignonette (*see* Annuals)
Musk (*see* Mimulus)
Petunias (*see* Annuals)
Primulas (*see* Primula)
Rhodanthe (*see* Annuals)
Schizanthuses (*see* Annuals)
Streptocarpuses (*see* Streptocarpus)
Sweet Peas
Verbenas (*see* Annuals)
Zinnias (*see* Annuals)

Plants raised from Cuttings.

Acacias (*see* Acacia)
Chrysanthemums (*see* Chrysanthemum)
Coleuses (*see* Coleus)
Cytisus racemosus (*see* Cytisus)
Fuchsias (*see* Fuchsia)
Geraniums, Zonal (*see* Geranium)
Hydrangeas (*see* Hydrangea)
Oleanders (*see* Nerium)
Pelargoniums (*see* Pelargonium)
Plumbagos (*see* Plumbago)
Salvias (*see* Salvia)
Solanums (*see* Solanum)

Plants from Bulbs or Offsets (see *Bulbs*).

Arum Lilies
Clivias
Daffodils
Freesias
Gladioli
Hyacinths
Liliums
Tulips

Plants propagated by Budding or Grafting.

Lilac (*see* Lilac)
Rose (*see* Roses)

It will be seen that a good many of the kinds recommended for the unheated house are also available for the cool structure; in the latter they may be expected to flower earlier.

Warm greenhouse.—Some of the preceding kinds can be forced into earlier bloom, and the structure will also be useful for raising seedlings for the flower and kitchen gardens. In a house in which a minimum winter temperature of 60° can be obtained the following plants may be grown; except where otherwise stated each plant is dealt with separately under its own name:—

Achimenes (*see* Bulbs)
Allamandas
Amaryllises
Anthuriums
Begonias
Bougainvilleas
Bouvardias
Caladiums
Carnations
Clerodendrons
Cockscombs
Crotons
Dipladenias
Eucharises
Exacum
Gardenias
Gesneras
Hoyas
Impatiens
Ixoras
Jacobinias
Jasmines
Justicias
Lapagerias
Lily of the Valley (*see* Bulbs)
Nepenthes
Poinsettias
Stephanotis
Thunbergias
Torenias

GREENHOUSE—*continued.*

Aspect.—Span-roof houses should run north and south. Lean-to houses should face south, or as near it as possible.

Heating.—This is a subject that must have careful consideration. In large houses it is only a question of which particular fire-boiler should be used, but with smaller structures the claims of oil and gas may be considered. The smaller a fire-boiler is the more difficult is the task of stoking it and dampering it in such a way as to keep it alight for 9 or 10 consecutive hours. On this account oil heaters may be chosen for very small houses. The types in which a lamp and boiler can be fixed outside the house, and connected with a set of pipes within, are safest. A slight smell of petroleum is not injurious to plants, but thick fumes are deadly, and every one knows how ready a flame is to "run up" spontaneously. Whenever an oil stove is set inside a house, a wide wick, rubbed clean daily, should be used, together with the best quality of oil. The light should be kept low when first lit, and watched till the danger-point of running up is past. For small-medium houses an upright boiler set in the wall of the house, and connected with a flow and return 4-in. pipe along two sides and one end, may be used. The pipes may be jointed with india-rubber rings and end in an expansion cistern. They should rise slightly from the boiler. For large ranges of houses a flat boiler should be used. The setting and fitting of the pipes should be a matter of contract in buying the heating apparatus. Anthracite coal, or coke, may be used as fuel, with a little breeze and refuse house cinders, for upright ones. Stoking can be learned by practice and observation. The fire should have a bright bottom, and the bars should be clear, last thing at night. The fire may be topped with some small damp fuel. In a flat-boiler furnace the glowing embers should be drawn to the front, and the fresh fuel thrown well back. The ashes should be cleared daily and the flues once a month.

Staging.—The most durable flat stage, and the best for the plants, is one consisting of large slates resting on a strong wooden framework and surfaced with white shell or shingle. This can be kept moist in hot weather.

Shading.—Shade is essential to some plants when grown under glass, notably Ferns, Cucumbers, and many Orchids; and it may be said to be beneficial for all in hot weather, while it lessens labour by reducing the necessity for watering. Movable shading in the form of tiffany or scrim blinds mounted on rollers which can be drawn up under a cover at the top of the house in dull or wet weather is the ideal. The larger seedsmen and nurserymen supply tiffany and scrim; the latter makes admirable blinds. A cheap form of shading is to paint the glass with one of the special preparations sold by seedsmen. This must, of course, remain on in dull as well as in bright weather. It should be removed in autumn.

Green Manure.—*See* Manure.

Grevillea (Grevĭll-ea, after Mr. C. F. Greville. Ord. Proteaceae). —Grevillea robusta is a graceful plant, grown for the sake of its slender branches and elegantly cut foliage. It is very useful for

mixing with other plants in a greenhouse, and may also be used for rooms. With care in watering (*see* Watering) and ventilating a room plant may be kept healthy for a long time. It is not quite hardy, and should be withdrawn from a window in cold weather and protected with a newspaper. Plants may be raised from seed sown in soil in a frame or greenhouse in spring, pricked off, potted singly, and repotted. Six-inch is a good size for the final pot. Loam and peat in equal parts, with a good deal of sand, make a suitable compost. G. robusta is illustrated in the *Botanical Magazine*, t. 3184.

Ground Ivy, Nepeta Glechoma.

Groundsel, Senecio vulgaris.

Guano.—An excellent nitrogenous fertiliser. In addition to the coarse imported product, called Peruvian, there are refined forms, such as Canary. It may be used with special advantage to green vegetables and Onions at the rate of 2 oz. per square yard. A thin coat spread over the soil of well-rooted pot plants and watered in is good. A useful liquid manure may be made by mixing half an ounce in a gallon of water.

Guelder Rose.—*See* Viburnum.

Guernsey Lily (Nerine sarniensis).—*See* Bulbs and Nerine.

Gum, Blue.—*See* Eucalyptus.

Gum Cistus.—*See* Cistus ladaniferus.

Gumming.—Stone fruits, such as Plums, Peaches, and Cherries, are liable to exude gum, particularly after hard pruning while the trees are leafless. Summer pruning is preferable. The branches should not be allowed to grow across each other and rub. Over-luxuriance should be checked by root pruning. *See also* Fruit.

Gunnera (gūn-nera, after J. E. Gunner. Ord. Halorageae).—Gunnera scabra is a hardy herbaceous perennial, with large, spreading, hairy leaves. A healthy plant makes a fine object by the waterside. It likes plenty of peat and leaf mould, with a covering of litter in winter. Propagation is by division in spring.

Gymnogramme, Gold fern, Silver fern (gymnogrām-me, from *gymnos*, naked, and *gramma*, writing, alluding to the spore cases. Ord. Filices).—These are among the most beautiful ferns for pots and hanging baskets; basket culture permits of the charming colours being clearly seen. Loam, peat, and leaf mould in about equal parts, with sand, suit. Propagation is by spores in heat (*see* Ferns). They need a good deal of water, with shade from hot sun in summer. Calomelanos chrysophylla, yellow; and schizophylla, silvery, are the principal kinds. There are several beautiful forms of both. Elegantissima, pulchella, and the crested variety of the latter called Wettenhalliana are also very good.

Gynerium, Pampas Grass (gynē-rium, from *gyne*, female, and *erion*, wool, in allusion to the woolly stigmas. Ord. Gramineae).—Gynerium argenteum is the noblest of grasses, throwing up long silky white plumes in late summer, which remain beautiful many

weeks; before frost touches them a few may be cut for house decoration. The Pampas Grass makes a splendid bed on the outskirts of a lawn if the position is sheltered, and the soil well drained. It is a hardy perennial, and may be planted in autumn or spring. Propagation is by seed, sown under glass in spring.

Gypsophila (gypsōph-ila, from *gypsos*, chalk, and *phileo*, to love—a chalk lover. Ord. Caryophylleae).—Graceful plants, one species of which, paniculata, is a hardy perennial that spreads into a broad bush and bears numerous sprays of lace-like bloom; it is good for mixing with cut flowers. It may be propagated by division, or raised from seed in spring, and thrives in most soils. There is a double variety. G. elegans is good as an annual (for culture, *see* Annuals). G. repens is a creeping white-flowered perennial, suitable for the rockery.

Gypsum (Sulphate of lime).—A useful fertiliser, valuable for fixing ammonia. For this reason it may be used with advantage over a manure heap, spread in a thin coat.

Habenaria (habenā-ria, from *habena*, a rein, in allusion to the spur. Ord. Orchidaceae).—A genus of Orchids, the most popular species of which are hardy, and thrive in sandy peat in the rock garden. Among these may be mentioned bifolia, the Butterfly Orchis, which grows about a foot high and produces white flowers in early summer; and fimbriata, lilac. Propagation is by division, the pieces being potted and started in a frame.

Haberlea (habēr-lea, after Professor Haberle. Ord. Gesneraceae).—Herbaceous perennials, the most popular of which is rhodopensis, a plant esteemed for the rockery, where it thrives in peaty soil if given a little protection in winter. It may be propagated by seeds or division in spring. It bears its lilac flowers in spring on stems a few inches high. *See* the *Botanical Magazine*, t. 6651.

Habrothamnus.—*See* Cestrum.

Haemanthus (haemān-thus, from *haima*, blood, and *anthos*, flower, referring to the colour. Ord. Amaryllideae).—Warm-house bulbs, thriving in sandy loam with a third of peat, propagated by offsets, and easily managed if given plenty of water in summer and kept dry in winter. A little of the top soil should be removed every spring and fresh substituted. The flowers are brilliant. The following are a few of the best: Cinnabarinus, red, spring; coccineus, scarlet, late summer (see *Botanical Magazine*, t. 1075);. and multiflorus (Kalbreyeri), scarlet, spring (*Bot. Mag.*, tt. 961 and 1995).

Ha-ha.—A sunk fence.

Halesia, Snowdrop Tree (halē-sia, after Dr. Hales. Ord. Styraceae).—H. tetraptera is a beautiful small deciduous tree, which bears charming white Snowdrop-like flowers in July. It likes a sheltered position in the shrubbery and a light, loamy, well-drained soil. Propagation is by root cuttings in a frame in spring, or by seeds. Very little pruning is required, but the bush should be kept shapely.

Hamamelis, Witch Hazel (hamamē-lis, from *hame,* together, and *mela,* fruit, in allusion to the flowers and fruit being on the tree at the same time. Ord. Hamamelideae).—These small deciduous trees are valuable because they flower early in the year and will thrive in town gardens. They enjoy a good loamy soil. Propagation is by cuttings and layers in autumn. Mollis is the best; it is covered with yellow flowers at mid-winter, when bare of leaves, and is pleasantly scented. Arborea also has yellow flowers. This is the Japonica of the *Botanical Magazine,* t. 6659.

Hand-glass or **Hand-light.**—A small glass case, sometimes made with a light, movable top, very useful for protecting half-hardy plants, or for keeping cuttings close until rooted; generally made with a cast-iron frame.

Hardening-off.—A term used to distinguish the treatment of a set of young plants which have been raised in heat, and have to be inured to the open air. The process is generally performed by putting them in a cold frame.

Harebell or **Hairbell,** Campanula rotundifolia.

Hare's-foot Fern, Davallia canariensis.

Hare's-tail Grass (Lagurus ovatus).—*See* Annuals.

Haricot.—The ripe seeds of Kidney Beans. They rarely mature in Great Britain.

Harpalium (harpā-lium, after Harpalyce. Ord. Compositae).—Hardy herbaceous perennials with showy yellow flowers, propagated by division in spring. Rigidum, the only species grown, is now called Helianthus rigidus by botanists.

Hart's-tongue Fern, Scolopendrium vulgare.

Hautbois.—A small Strawberry. *See* Fruit.

Hawkweed, Hieracium.

Hawthorn.—*See* Crataegus.

Hazel, Nut (Corylus Avellana).—*See* Fruit.

Hazel, Witch.—*See* Hamamelis.

Heart's-ease.—*See* Pansy.

Heath.—*See* Daboëcia and Erica.

Heather.—*See* Calluna.

Heating.—*See* Greenhouse.

Hedera, Ivy (hēd-era, from *hedda* (Celtic), cord, referring to the stems. Ord. Araliaceae).—Many people would not recognise the "Ivy green" under the name of Hedera helix, but it is well to keep the botanical name in mind, because nurserymen often exhibit improved forms of Ivy as Hederas. The common green Ivy is rarely planted on houses nowadays, as the variegated sorts are more attractive. But the common Ivy is useful for making a screen, covering a bank, or planting against an outhouse. That and the Irish (Canariensis) are two of the fastest growers. Those who want a screen as quickly as possible should buy strong plants on stakes in pots. Each plant will have several shoots, which may be spread

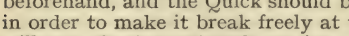
out and tied in position. One of the largest-leaved Ivies is dentata, and there is a handsome form of this called variegata, the dull green leaves of which have a yellow edge. Another handsome form is Maderensis variegata, green with a broad white edge. Marginata aurea, marmorata, Raegneriana, and rhombea are also handsome forms. The Ivies may be planted in autumn or spring, and will thrive on most kinds of soil, though if planted late on poor chalky soil they are slow in making a start. They are propagated by cuttings in a cold frame in autumn, and in the nurseries by grafting. Clipping should be done just before new growth starts in spring. The tree Ivy, arborescens, has many forms, which may be grown in shady spots and need no support.

Hedges.—A good hedge serves the double purpose of a fence and a shelter; consequently, many who are enclosing ground for a garden turn their thoughts to a living dividing line. It must be remembered, however, that several years are required to make a good hedge, the time varying with the soil and climate. With rich soil and a moist climate it is possible to get a fair hedge in 6 years; with poor soil and a dry climate 10 are required. For this reason a hedge enclosure is of no service as an immediate guard against sheep and cattle, and a wooden or wire fence is needed in addition (*see* Fences). It is a good plan to plant a hedge within a fence, for the sake of the shelter which it provides. It should not be made close to the fence, or it could not be pruned properly. If the fence is an open one of wire 4 ft. must be left, or cattle will eat it down. At that distance, and with wire netting at the lower part to keep out lambs, it will be safe. Whitethorn (Quick) is the best hedge plant. It should be planted 9 ins. apart all ways in a double row, thus—



How to plant a Hedge.

1, 2. Level of ground. 3. Soil removed each side and made into a ridge.



each three plants forming a triangle. The soil should be manured beforehand, and the Quick should be shortened to about 9 ins. high, in order to make it break freely at the base. If pruned annually it will grow bushy and make an impenetrable barrier to stock, which will keep clear of it. When in bloom in May it will be attractive. Privet is another good hedge plant, and may be treated in the same way as Quick, except that a single row suffices if the plants have been well shortened in the nursery; but it must be well protected while young, or sheep will eat it down. The oval-leaved is nominally evergreen, but a good many, sometimes all, the leaves fall in winter. It should be pruned twice annually, in June and September. A drawback to Privet in the estimation of many is the odour of the flowers, which they find disagreeable, and even injurious. Myrobalan Plum makes a good, inexpensive hedge. For inner hedges

Yew (which is poisonous to animals), Sweet Brier (*see* Brier), Hornbeam, Beech, Laurel, Box, and Holly may be mentioned. Yew hedges are very appropriate for formal gardens, and may be clipped into shape as desired, but they grow slowly.

Helenium (helē-nium, after Helen of Troy. Ord. Compositae).—Hardy perennials, with showy flowers in late summer. Pumilum is the most popular; it has yellow flowers on stems about a foot high. In the variety striatum the flowers are striped with red. Grandiflorum has large flowers. All these are varieties of autumnale, for which *see* the *Botanical Magazine*, t. 2994. For culture, *see* Flower Garden—Herbaceous plants.

Helianthemum, Sun Rose (heliān-themum, from *helios*, the sun, and *anthemon*, flower. Ord. Cistineae).—Brilliant plants for the rock garden, where they will thrive in light, sandy soil in sunny spots, and make a bright display in early summer. They may be raised from seed or propagated by cuttings in a frame. The common species is vulgare, a yellow-flowered trailer, but many flower lovers prefer to select a few good named forms for their rockeries, such as Fireball, Golden Queen, Innocence, Primrose Dame, Jubilee, Garibaldi, and Pink Beauty. There are many colours to choose from.

Helianthus, Sunflower (heliān-thus, from *helios*, sun, and *anthos*, a flower; so called because the flowers are believed to follow the sun round. Ord. Compositae).—The Sunflowers, annual and perennial, are among the most popular of hardy herbaceous plants, and should always be planted in large borders to give a display when most of the summer flowers are over. The species vary a great deal in height, some being no more than 3 or 4 ft., while others rise to 8 or 10 ft. They make their finest growth in a moist, fertile soil. The perennials are easily propagated by division from autumn to spring, and the annuals by seed (*see* Flower Garden and Annuals). Of the annuals, cucumerifolius, New Miniature, Munstead Primrose, and Stella are good. Multiflorus maximus is a fine single perennial form, and flore pleno a splendid double. All the foregoing grow about 4 ft. high. Rigidus Miss Mellish is also a good plant.



PROPAGATING HELIOTROPE BY CUTTINGS.

1. Growing tip. 2. Point of severance. 3. Leaves to be removed. 4. Depth of insertion.

Helichrysum (Everlasting).—*See* Annuals.

Heliotrope, Heliotropium (heliotrō-pium, from *helios*, sun, and *trope*, twining, in allusion to the twining shoots. Ord. Borragineae).—One of the most richly perfumed of all flowers, and if not brilliant yet pretty and pleasing. It may be grown in pots, and if pinched can be kept fairly compact and suitable for a small house. On the other

hand, if there is plenty of room against a wall or pillar it may be planted out under glass and allowed to ramble, when it will soon cover a considerable area and bloom profusely. Standard Heliotropes can be formed by pinching out the side shoots to a height of a foot, and then letting a few shoots start. These can be stopped at about 4 ins. long to induce laterals, and so a head is formed. Loam, with a fourth of decayed manure, and some sand, is suitable. Propagation is by seeds sown under glass in spring or by cuttings in late summer in a warm house. Heliotropes are tender plants, but they may be planted out of doors in June. The following are good: Adèle, Miss Nightingale, Rose Clair, and White Lady. But the old lilac species, peruvianum, should not be overlooked, as it is very floriferous and sweet.

Helleborus, Christmas and Lenten Roses (hellēb-orus, from *heleim*, to kill, and *bora*, food, indicating its poisonous nature. Ord. Ranunculaceae).—*See* Bulbs—Christmas and Lenten Roses.

Hemerocallis, Day Lily (hemerocāl-lis, from *hemero*, day, and *kallos*, beauty, alluding to the brief duration of the flowers. Ord. Liliaceae).—*See* Bulbs.

Hen-and-chickens.—*See* Bellis (Daisy). The name is sometimes applied to Saxifraga umbrosa.

Hepatica (hepāt-ica, from *hepaticos*, liver, in allusion to the lobed leaves. Ord. Ranunculaceae).—These charming little plants are now classed with the Anemones by botanists, but they are generally grown separately in gardens. They are beautiful little plants, blooming freely in winter. They are not particular as to soil, but must have shade. Propagation is by seeds. There are several varieties with different colours.

Herbaceous Borders and Plants.—*See* Flower Garden.

Herb Robert, Geranium Robertianum.

Herbs.—*See* Kitchen Garden.

Hermaphrodite.—Flowers which contain both male and female organs.

Herniaria, Rupture Wort (herniā-ria, from *hernia*, a rupture. Ord. Illecebraceae).—The small species glabra is in demand by carpet bedders, who use it for making lines and cushions of green. It is a hardy plant, not fastidious as to soil, and easily propagated by division in autumn.

Heron's-bill.—*See* Erodium.

Hesperis, Rocket (hēs-peris, from *hesperos*, evening star, alluding to the strong perfume at night. Ord. Cruciferae).—Hardy biennials and perennials, thriving in ordinary soil, and easily propagated by seed or division. The Sweet Rocket, H. matronalis, is a perennial with purplish flowers, but the colour is variable. There are several forms of this handsome and fragrant old plant, which will grow almost anywhere, and thrives in chalk. Tristis is a biennial, also variable in colour, and sweetest at night (*see* the *Botanical Magazine*, t. 730).

Heuchera (hēū-chera, after Professor Heucher. Ord. Saxifrageae).—Heuchera sanguinea is a highly esteemed hardy plant, producing close tufts of roundish leaves and long graceful sprays of brilliant rosy-carmine flowers. Other colours have been got by selection and crossing. The plant is a hardy herbaceous perennial, and may be raised from seed or by division in spring. It is not particular about soil, and does well on limestone. It enjoys a little shade. Both as a border and rockery plant the Heuchera is desirable. The flowers are charming for cutting (*see* the *Botanical Magazine*, t. 6929). Micrantha, with yellowish flowers, is also worth growing.

Hibbertia (hibbēr-tia, after Mr. G. Hibbert. Ord. Dilleniaceae).—Evergreen greenhouse trailers. Dentata, the yellow flowers of which contrast well with the dark leaves and ruddy stems, blooms in winter. Sandy loam with a third of peat suits. Propagation is by cuttings in a propagating case in spring.

Hibiscus (hibīs-cus, the classical name for the Marsh Mallow. Ord. Malvaceae).—This genus includes both herbaceous and shrubby plants, annuals and perennials. All are showy. The following are popular: Manihot is a greenhouse rambler with yellow spotted flowers (*see* the *Botanical Magazine*, tt. 1702 and 3152). Rosa-sinensis is a stove rambler with rosy-crimson flowers which are borne in winter. There are several varieties of this brilliant species, which is shown in the *Bot. Mag.*, t. 158. Syriacus is a hardy deciduous shrub with purple flowers, and there are many varieties of it; it thrives near towns (*see* the *Bot. Mag.*, t. 83). Propagation is by cuttings, those of the indoor species in heat, those of the hardy ones in cold frames. Sandy loam, with leaf soil, makes a good compost.

Hieracium, Hawkweed (hierā-cium, from Pliny's name, given because of the supposed virtues of the juice. Ord. Compositae).—Hardy herbaceous perennials, of which gymnocephalum, with downy leaves and yellow flowers in July, is one of the best for the rockery. Ordinary soil. Propagation by division.

Hippeastrum (Amaryllis).—*See* Bulbs.

Hippophae, Sea Buckthorn (hippōph-ae, from *hippos*, a horse, and *phao*, to kill. Ord. Elaeagnaceae).—H. rhamnoides, the Sea Buckthorn, is a dwarf hardy deciduous shrub which thrives on sand hills close to the sea. It bears a crop of yellowish fruits. It may be propagated by seeds, suckers, and layers.

Hoe.—One of the most useful of garden tools. The Dutch hoe is good for running through the soil to loosen the surface and uproot small weeds. The draw hoe, of which the swan-neck is an improved form, is good for dealing with larger weeds when a chopping action is required. The Sproughton may be used either as a push or draw hoe, and is a valuable although somewhat heavy tool. The Canterbury, made with 2 or 3 teeth, is good for drawing large drills and for earthing Potatoes. Regular hoeing is good for crops, particularly in dry weather, because it prevents the soil cracking and drying. The various forms of hoe should be of steel, mounted on ash handles.

Holly, Ilex (ī-lex, from Virgil's Ilex, the name being given owing to the resemblance of the leaves. Ord. Ilicinae).—One of our most beautiful evergreens, the Holly does good service in the garden and shines with a bright and cheerful glow in our rooms at Christmas. It will thrive in most soils, but it is a slow grower in its early stages on the best of land, and on poor chalky soil may show only a few inches of fresh growth a year until it is well established. A deep, fertile, moist but drained soil is desirable. The best time for planting is April, when, shifted with a mass of fibrous roots, planted immediately, and watered in, they generally thrive. Propagation is by seeds, but the choice varieties are increased in the nurseries by grafting on common stocks. Cuttings will strike in summer. For pruning, *see* Evergreens. The following are good varieties: argentea marginata, argentea medio-picta (Silver Milkmaid), aurea medio-picta (Gold Milkmaid), aurea regina (Golden Queen), ferox argentea (Silver Hedgehog), Hodginsii, and Watereriana. All except Hodginsii have variegated leaves.



Hollyhock Disease
1. Disease on stem.
2. Disease on leaves.

Hollyhock (Althaea rosea. Ord. Malvaceae).—A grand old favourite, the Hollyhock has suffered in recent years through the attack of a fungus, Puccinia malvacearum, which begins on the lower leaves and works its way up the stems, completely disfiguring the plants. An early application of Bordeaux Mixture (which see) is a remedy. Many consider that the disease was induced by excessive vegetative propagation in bygone years, when named varieties were in demand; consequently, they now grow Hollyhocks as seedlings, raising them out of doors in early summer and planting out in autumn, the same as Wallflowers. In cold, exposed places the plants ought to be wintered in frames. Propagation may also be effected by cuttings in spring, in sandy soil in heat, and by grafting. A deep, fertile, well-drained soil is desirable.

Holly, Sea.—*See* Eryngium.

Holm Oak.—*See* Quercus.

Honesty, Lunaria biennis (lunā-ria, from *luna*, moon, in allusion to the seed vessels. Ord. Cruciferae).—The Honesty derives its name from the flat white transparent seed pods which follow the flowers. These pods may be cut in sprays and used for room decoration in winter. The plant is easily raised from seed in late spring, is a hardy perennial, and will thrive in most soils if the site is shady, but prefers a moist, heavy soil. It is attractive when in bloom, for the flowers are borne freely, and are bright rose in colour. There is a white variety.

Honey Plant.—*See* Hoya.

Honeysuckle, Lonicera (lonīc-era, after Dr. Lonicer. Ord. Caprifoliaceae).—Beautiful and fragrant twiners, suitable for covering walls, pillars, pergolas, trelliswork, and fences. They are hardy

deciduous perennials, thriving in most soils. Planting should be done between November and mid-April inclusive. Propagation is effected by layers in autumn. The red fruits of some of the species are attractive. Flexuosa (syns. brachypoda and Japonica chinensis) (*see* the *Botanical Register*, t. 712) is one of the best of the Honeysuckles, and its variety aureo-reticulata, which has small, gold-netted leaves, is a pretty plant. Caprifolium, with pale yellow flowers, and Periclymenum, yellow and red, are fragrant British species with attractive fruits. Sempervirens has scarlet and yellow flowers (*see* the *Botanical Magazine*, t. 761). Fragrantissima and Standishi are winter bloomers and bear white flowers.

Hop.—*See* Humulus.

Hordeum jubatum (hōr-deum, the Latin name of barley. Ord. Gramineae).—A hardy annual Grass. For culture, *see* Annuals—Hardy.

Horehound.—*See* Kitchen Garden—Herbs.

Hornbeam.—*See* Carpinus and Hedge.

Horseradish.—*See* Kitchen Garden.

Hotbeds.—A hotbed is very useful in a garden. It may be made up in spring with manure alone. The material should be taken straight from the stables and turned well on successive days to drive off the rank gases; it should then be built up into a bed about a yard high, being well trodden as the work proceeds. A frame can then be placed on. Half-hardy annuals, Tomatoes, Cucumbers, Vegetable Marrows, Celery, and other crops can be raised in a manure-heated frame in spring, being sown in pots or boxes and stood on the manure. Dahlias and other plants can be started in it. A hotbed can also be used for growing Cucumbers and Mushrooms. In autumn manure and leaves can be mixed to force a frame of Violets.

Hoteia.—*See* Astilbe.

Hothouse.—*See* Greenhouse.

Hottonia (Water Violet).—*See* Flower Garden—Water plants.

Houseleek.—*See* Sempervivum.

Houstonia (houstō-nia, after Dr. Houston. Ord. Rubiaceae).—H. caerulea is a charming little plant for the rockery, clinging closely to the stones, and bearing blue flowers in spring. It likes a loamy soil, but does not object to lime. Propagation is by division or seeds in spring. There is a white variety.

Hoya, Wax-Flower (hōy-a, after Mr. Hoy. Ord. Asclepiadeae).—There are several species of Hoya, all distinguished by flowers of waxy texture. The most popular is carnosa, pink, blooming in summer (*see* the *Botanical Magazine*, t. 778). There is a variety with variegated leaves. Bella, with purple and white flowers (*Bot. Mag.*, t. 4402), is also grown. They are rambling plants suitable for the roof of a warm greenhouse, or a pillar. They like peat, with a third of loam and sand. Propagation is by cuttings in heat in

spring or summer. The shoots should be thinned out when they become crowded. Vigorous syringing in summer will keep down mealy bug. Very little water should be given in winter. We know of a plant thriving for years in a sitting-room.

Humea (hū-mea, after Lady Hume. Ord. Compositae).—Humea elegans is one of the most distinctive of plants, not only on account of its appearance, although that is uncommon, but because of its piquant and agreeable perfume. It grows several feet high in a season, and produces long plumes of red inflorescence. Two or three plants will scent a large house. It is easily raised from seed, which may be sown in a warm frame or greenhouse in summer, the seedlings pricked off, potted singly, and repotted till they are in 6-in. or 7-in., in which they may bloom. Loam, with a third of decayed manure and some sand, makes a suitable compost. The plants may be discarded after flowering. It is thus treated as a biennial.

Humulus (hū-mulus, from *humus*, the ground, in reference to the creeping habit. Ord. Urticaceae).—This genus gives us the commercial hop, which is used for flavouring beer. The Japanese Hop, H. Japonicus, is worth planting in the garden for the pillar of a pergola. It will thrive in ordinary soil, and may be increased by division in spring. There is a golden-leaved variety called aureus.

Humus.—*See* Manure and Lime.

Hunnemannia (hunnemān-nia, after Herr Hunnemann. Ord. Papaveraceae).—H. fumariaefolia is a brilliant Poppywort, with yellow flowers in summer. It is a herbaceous perennial, not entirely hardy, and needing a sheltered place or frame protection in winter. It may be propagated by seeds sown outdoors in summer, and likes light, well-drained soil. *See* the *Botanical Magazine*, t. 3061.

Hutchinsia (hutchīn-sia, after Miss Hutchins. Ord. Cruciferae). —The most popular species of this small genus is alpina, a pretty little plant for the rockery, clinging closely to the stones and covering itself with white flowers in spring. It likes a sandy compost, and thrives in limestone. Propagation is by seed in spring.

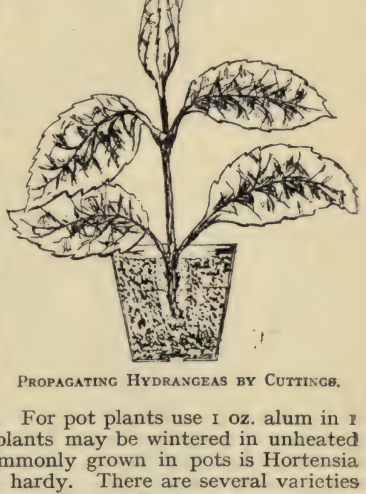
Hyacinth.—*See* Bulbs.

Hyacinthus (*see also* Bulbs).—H. amethystinus is the Spanish Hyacinth (*see* the *Botanical Magazine*, t. 2425); H. orientalis is the common Hyacinth (*Bot. Mag.*, t. 937). The variety of orientalis called albulus is the white Roman Hyacinth. H. candicans is also called Galtonia candicans. It is a good plant for the herbaceous border.

Hybrid, Hybridisation.—A hybrid is a cross between two species. In rare cases (*e.g.*, amongst a few kinds of Orchids) genera have been crossed, and the offspring are called bigeneric hybrids. When hybrids are crossed between themselves the offspring are called varieties. When species are crossed the work is described as hybridisation; when varieties are crossed it is spoken of as cross-fertilisation. In both cases it consists in taking pollen from the anthers of one flower and placing it on the stigma of another. This

process would be inocuous if the stigma had been already fertilised, either by pollen from the same flower (self-fertilisation or selfing), or had been transferred by wind or bee from another flower; therefore the anthers must be removed from the flower to be crossed before the pollen is ripe and the blossom enclosed with a muslin bag. Those who wish to hybridise systematically should study Mendel's laws.

Hydrangea (hydrān-gea, from *hydor*, water, and *aggeion*, a vessel, in allusion to the cupped shape of the seed vessel. Ord. Saxifrageae).—The Hydrangeas are hardy deciduous shrubs, and some species are grown exclusively in the open air; but hortensis is much esteemed as a pot plant, on account of the large heads of pink blooms which it produces. It is easily raised from cuttings. Shoots may be taken in spring, and inserted singly in small pots in sandy compost containing leaf mould in a warm frame, or shoots with buds may be struck in autumn. When the plants are well rooted they may be shifted to 5-in. or 6-in., in which they may flower. Loam, with a little decayed manure or leaf mould, and some sand, will suit. When planted out in soil containing iron the colour changes to blue. For pot plants use 1 oz. alum in 1 gallon of water. Young pot plants may be wintered in unheated frames. The species most commonly grown in pots is Hortensia (hortensis), which is not quite hardy. There are several varieties of it, notably Mariesii and Thomas Hogg. Paniculata grandiflora is a splendid hardy variety with white flowers in late summer. Petiolaris has white flowers in spring, and is sometimes seen on an outside wall in mild districts, but it is not quite hardy. *See* the *Botanical Magazine*, t. 6788.



PROPAGATING HYDRANGEAS BY CUTTINGS.

Hymenocallis.—*See* Pancratium under Bulbs.

Hymenophyllum (hymenophȳl-lum, from *hymen*, a membrane, and *phyllon*, leaf. Ord. Filices).—Filmy ferns. They thrive in peat with Sphagnum moss, broken sandstone, and sand. They must have a saturated atmosphere (*see* Ferns). Tunbridgense and unilaterale are the best-known species.

Hypericum, St. John's Wort (hypēr-icum, from *yperikon*, on account of, and *ereike*, heath, from the habitat. Ord. Hypericineae).—Useful hardy perennials, some herbaceous, others shrubby, with dense green foliage and yellow flowers. The best species is calycinum, the Rose of Sharon, for it will thrive on dry banks as well as under trees. It should be planted a foot apart in autumn if a close

mass is wanted. See *Botanical Magazine*, t. 146. The shrubs are propagated by cuttings in a frame, the herbs by division in spring. Androsaemum is a good sub-shrub. Hookerianum is worth growing, and Moserianum is a fine hybrid. All those named are shrubs, and have yellow flowers in summer.

Hyssop.—*See* Kitchen Garden—Herbs.

Iberis, Candytuft (ibē-ris, from Iberia. Ord. Cruciferae).—Useful hardy annuals and perennials. For the former, *see* Candytuft and Annuals. The perennials are grown in the rock garden, and soon cover a considerable area. They are not fastidious about soil, and are easily increased by cuttings or seeds. The following are a few of the best: corifolia, evergreen, 4 ins.; gibraltarica, not quite hardy, 1 ft. (see *Botanical Magazine*, t. 124); sempervirens, evergreen, 1 ft., and its variety Garrexiana, which has larger flowers. They have white blossoms in early summer. Gibraltarica is pink.

Ice Plant.—*See* Mesembryanthemum.

Ilex.—*See* Holly.

Imantophyllum.—*See* Clivia and Bulbs.

Imbricated.—A flower is said to be imbricated when the petals lap over each other.

Impatiens, Balsam (impā-tiens, from *impatiens*, referring to the quick discharge of the seeds. Ord. Geraniaceae).—One of the most popular species of Impatiens is Sultani, a dwarf plant with brilliant carmine flowers, easily raised from cuttings in a warm house, and so floriferous that it is hardly rooted before it begins to bloom. It thrives in loam, with a little leaf mould and sand. See *Botanical Magazine*, t. 6643. Episcopi is a good variety of it. Hawkeri is also a good hothouse species with scarlet flowers. The most popular of the Impatiens is, however, the half-hardy annual Balsam. *See* Balsam and Annuals.

Impregnation.—*See* Hybridisation.

Incarvillea (incarvill-ea, after P. Incarville. Ord. Bignoniaceae).—Beautiful hardy plants, of which the most popular species are Delavayi and grandiflora. Both have large, deeply cut leaves and bell-shaped carmine-rose flowers in summer. They are hardy perennials, growing in most soils, and easily raised from seed under glass in spring, or propagated by division. The height is about 18 ins. Grandiflora is considered by many to be merely a variety of Delavayi. Olgae is a purple-flowered species growing somewhat taller.

Indian Corn.—*See* Maize.

Indian Cress.—*See* Nasturtium.

Indian Fig (Opuntia).—*See* Cactus.

Indian Pink.—*See* Dianthus and Biennials.

Indian Shot.—*See* Canna.

India-rubber Plant.—*See* Ficus.

Insects.—The principal insect pests of plants are referred to under their own names in this work, or in connection with the crops which they affect, and remedies given.

Inula (īn-ula, perhaps a corruption of Helenium. Ord. Compositae).—I. glandulosa is a fine hardy herbaceous perennial, growing about 18 ins. high, and with large deep yellow flowers in summer. It is well worthy of a place near the front of the border. It thrives in most fertile soils, and likes clay if friable. Propagation is by division in spring. I. Helenium, the Elecampane, is a taller plant. Hookeri is a fine pale yellow species blooming in late summer (*see* the *Botanical Magazine*, t. 6411).

Ionopsidium, Violet Cress (ionopsīd-ium. Ord. Cruciferae).—I. acaule is a dainty little violet-flowered hardy annual only growing about 2 ins. high. It will grow in almost any soil, and is raised from seed sown where it is to bloom in spring (syn. Cochlearia acaulis).

Ipomaea, Convolvulus (ipomāē-a, from *ips*, bindweed, and *homoios*, similar. Ord. Convolvulaceae).—This genus is closely allied to that of Convolvulus, and some plants commonly called Convolvuluses are really Ipomaeas. C. major, for instance, is really I. purpurea. Of the plants usually grown under the name Ipomaea may be mentioned Bona-nox, a white hothouse evergreen climber, blooming in late summer (*see* the *Botanical Magazine*, t. 752); hederacea (syn. Nil), a blue half-hardy perennial (*Bot. Mag.*, t. 188), and its varieties grandiflora and Huberi variegata; Horsfalliae, a rose winter-flowering hothouse evergreen; Leari (syn. Pharbitis Learii), a blue autumn-blooming hothouse evergreen (*Bot. Mag.*, t. 3928); and versicolor (syn. Mina lobata), a hardy annual, various colours. The annuals are raised from seed, the perennials from cuttings in sandy peat in heat. Loam, with some leaf soil, decayed manure, and sand, makes a suitable compost. The hothouse climbers should be thinned after flowering.

Iresine (iresī-ne, from *eiros*, wool, in allusion to the woolly shoots. Ord. Amarantaceae).—The Iresines were more important plants in the old carpet-bedding days than they are now. They are tender perennials, dwarf, with narrow, highly coloured leaves, which made them useful for formal designs. They thrive in most soils. Propagation is by cuttings in gentle heat towards the end of summer. They should not be potted off till spring, and need very little water in winter. Herbstii (see *Botanical Magazine*, t. 5499), Wallisii, and Lindeni all have dark leaves.

Iris (ī-ris, from *iris*, the eye. Ord. Iridae).—The Iris is a strikingly beautiful hardy flower, and it is not surprising that many people like to grow a collection. But the species need not all be put together. The larger, such as the Flag, English, and Spanish, may be planted in herbaceous borders; and the smaller on the rockery. The Flags have rhizome roots and evergreen foliage; the English and Spanish have bulbous roots and lose their leaves every

year. The following are beautiful Flag Irises, which may be bought and planted in ordinary soil in autumn:—

Bridesmaid	Hannibal
Pallida Dalmatica	Madame Chereau
Gracchus	Sibirica

Any one who is fond of Spanish Irises, and likes to form a little collection of named sorts, may plant the bulbs among his Roses. The two plants do not interfere with each other to any injurious extent, and they look well in association. The Irises may be planted in October or November, about 2 ins. deep. The following are pretty varieties:—

Blanche Superbe	Leander
Chrysolora	Louise
King of the Blues	Snowball
La Tendresse	Thunderbolt

The real Iris lover is not likely to stop short with the Flags, English, and Spanish. He or she will want to have a number of beautiful species, and the following are all lovely:—

alata	Pavonia (not hardy)
Bakeriana	Persica
biflora	pumila
cristata	reticulata
florentina	Sindjarensis
Gatesii	Sisyrinchium
histrio	stylosa
iberica	Susiana
laevigata	Tubergeniana
Lortetti	

These, with the hybrids now sold by hardy plant specialists, make an interesting selection. The varieties of laevigata (Kaempferi) are splendid waterside plants. Most of the small bulbous varieties, on the other hand, do best in warm, dry, sunny spots on the rockery.

Irish Heath.—*See* Daboëcia.

Irish Ivy.—*See* Ivy.

Isatis, Dyer's Woad (isā-tis, from *isazo*, to equal, alluding to its smoothing power. Ord. Cruciferae).—A small genus, only one species of which, glauca, a yellow hardy biennial, blooming in summer, is grown to any extent. Propagation is by seed, and ordinary soil suits. Woad is obtained from I. tinctoria. The industry is now of small proportions.

Isolepis (ī-so-lē-pis, from *isos*, equal, and *lepis*, a scale. Ord. Cyperaceae).—I. gracilis is a pretty grassy plant, well adapted for growing in small pots to stand at the edge of greenhouse stages, where, drooping over and making a foreground to flowering plants, it serves a useful purpose. It may be raised from seed in a frame or greenhouse, and when established may be increased by division in heat in spring. Loam, with a third of leaf mould and some sand, suits it.

Ivy.—*See* Hedera.

Ivy-leaved Geranium.—*See* Geranium and Pelargonium.

Ivy-leaved Toadflax (Linaria Cymbalaria).

Ixia (ĭx-ia, from *ixia*, birdlime, because of the thick juice. Ord. Iridae).—*See* Bulbs.

Ixiolirion (ixiolīr-ion, from *ixia*, and *leirion*, lily—the Ixia-like Lily. Ord. Amaryllideae).—Charming hardy bulbs, flowering in June, suitable for the rockery or the front of the border. They are not particular as to soil. Propagation is by offsets. Montanum and Pallasi, 1 ft. high, with blue flowers in June, are two of the best.

Ixora (ixōr-a, after the god Iswara. Ord. Rubiaceae).—Brilliant hothouse plants, somewhat resembling Bouvardias, but with larger heads of bloom. They like a compost of 2 parts loam, 1 each leaf mould and decayed manure, and some sand. Propagation is by cuttings in heat when the shoots are half matured. The young plants may be pinched to make them bushy. Regular syringing in summer will do a good deal towards keeping insects under, but if necessary the leaves should be syringed with an insecticide. Vaporise with cones. The best are coccinea, scarlet, summer bloomer; and Duffii (syn. macrothyrsa), scarlet, summer. Grandiflora, Fraseri, and superba are good varieties of coccinea.

Jacobaea.—*See* Senecio.

Jacobaea Lily.—*See* Amaryllis (Sprekelia) formossima under Bulbs.

Jacobinia (jacobĭn-ia. Ord. Acanthaceae).—Hothouse shrubs with brilliant flowers. J. chryostephana blooms in winter, when it produces large clusters of beautiful yellow flowers (*see* the *Botanical Magazine*, t. 5887). Carnea (syn. Justicia carnea) has pale rose flowers in summer (see *Botanical Register*, t. 1397). Ghiesbreghtiana has scarlet flowers in winter. All grow about 2 ft. high. Equal parts of loam and peat, with a little decayed manure and some sand, suit. Propagation is by cuttings in a propagating case.

Jacob's Ladder, Polemonium caeruleum.

Japan Cedar, Cryptomeria.

Japanese Dwarf Trees.—Considerable interest is taken in these quaint examples of Eastern art, and collections are grown in various British and American gardens. By cramping the roots and twisting the shoots, trees many years old are kept at a height of 2 or 3 ft. They are generally grown in ornamental bowls. Genuine specimens are somewhat expensive.

Jasmine, Jasminum (jasmī-num, from *ysmyn* (Arabic). Ord. Oleaceae).—These sweet-scented ramblers are great favourites, and one hardy species, nudiflorum, is common in most gardens, large and small, bearing its yellow flowers during mild spells in winter when devoid of leaves (*see* the *Botanical Magazine*, t. 4649). The pretty white Jasmine, gracillimum, is also a great favourite (*Bot. Mag.*, t. 6559). It requires a warm house. Grandiflorum

will thrive in a greenhouse, and bears white flowers in late summer (see *Botanical Register*, t. 91). Officinale is the common white hardy Jasmine (*Bot. Mag.*, t. 31). The hardy Jasmines will thrive in any fertile soil; equal parts of peat and loam, with some sand, suit the others. The outdoor kinds may be increased by layers or suckers, the indoor by cuttings taken off with a heel of old wood and inserted in sandy peat under a bell-glass. When the young plants begin to grow the tip should be pinched out, when side shoots will break freely. The branches should be thinned when they get crowded, and young wood cut to spars.



PRUNING JASMINE.
1. Leading shoot.
2, 3, 4, 5. Spurs.

Jasmine, Rock.—*See* Androsace.

Jerusalem Artichoke.—*See* Kitchen Garden.

Jessamine.—*See* Jasmine.

Job's Tears.—*See* Coix.

Jonquil.—*See* Bulbs.

Judas Tree.—*See* Cercis.

Juglans, Walnut (jū-glans, from *Jupiter Jovis*, the god, and *glans*, a nut—literally, Jupiter's nut. Ord. Juglandeae).—The Walnut, Juglans regia, is a hardy deciduous tree, thriving in any fertile soil. The nut is encased in a thick green case, which will decay after storing in autumn. Propagation is by seeds for the common kind, by budding or grafting for the special varieties. There are several varieties.

Julus (Millipede).—The species complanatus and pulchellus guttatus are short, many-legged, quick-moving "insects," often found about the roots of plants. Soot water and brine may be used to get rid of them; or they may be trapped with pieces of Mangold.

Juniperus, Juniper (junīp-erus, from *juniperus* (Celtic), rough. Ord. Coniferae).—Handsome evergreens, some hardy, others requiring the shelter of a greenhouse. Good varieties are well worth growing as lawn plants. They do not care for stiff, damp soil, thriving best in light, friable ground. Propagation is by seeds or cuttings in August in a frame or under a bell-glass. Chinensis aurea and C. albo-variegata are good lawn trees. There are several good varieties of communis, the common Juniper, notably fastigiata and glauca. Virginiana is the Red Cedar, and there are many varieties of it, such as argentea, aureo-variegata, and pendula. Bermudiana, the Bermuda Cedar, must be grown in a greenhouse.

Justicia (justī-cia, after Mr. J. Justice. Ord. Acanthaceae).—This genus is closely related to Jacobinia, and in fact is incorporated with it by modern botanists, but certain species are grown in gardens under the name of Justicia. Carnea, coccinea, ghiesbreghtiana, and magnifica are cases in point. For culture, *see* Jacobinia.

Kaffir Lily (Schizostylis coccinea).—*See* Bulbs.

Kalanchoe (kalanchō-e, the Chinese name. Ord. Crassulaceae).—

Succulent plants, with flowers on terminal heads. K. flammea is a brilliant warm greenhouse plant, grown for its beautiful orange flowers in spring. It likes loam with a third of leaf mould and sand. Propagation is by cuttings in sandy soil.

Kale.—*See* Kitchen Garden.

Kalmia (kālm-ia, after Peter Kalm. Ord. Ericaceae).—Handsome hardy evergreen shrubs. K. latifolia is worth growing as a foliage shrub alone. They like peat, and are propagated by seeds in spring, layers in autumn, or cuttings of side shoots in summer. The three species angustifolia, glauca, and latifolia are all grown. There are several varieties of the first and last. They all dislike lime.

Kalosanthes.—*See* Crassula and Rochea.

Kentia (kēnt-ia, after Lt.-Col. Kent. Ord. Palmae).—A genus of palms, giving us one or two species, such as Belmoreana, Canterburyana, and Forsteriana, which are good for rooms as well as for greenhouses. For culture, *see* Palms. Botanists now refer the first and last to the genus Howea, and Canterburyana to Hedyscepe.

Kerria Japonica (kēr-ria, after Mr. M. Kerr. Ord. Rosaceae).—A useful dwarf yellow-flowered deciduous shrub, thriving in almost any soil, and blooming profusely in late spring (*see* the *Botanical Magazine*, tt. 1873 and 1296). Corchorus Japonicus is a synonym; the double, flore pleno, is a still better plant, giving a richer and more lasting effect with its larger flowers. They may be grown in the shrubbery, but are better on walls or fences. Propagation is by cuttings of young shoots under a hand-light. Pruning may consist of cutting out crowded shoots. The plants may be forced in pots if desired.

Kidney Bean.—*See* Kitchen Garden.

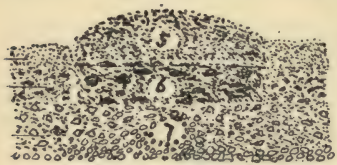
Kitchen Garden.—A well-managed kitchen garden is a source of much benefit to the household, as a constant supply of delicious and wholesome vegetables can be provided. It will contain not only an adequate supply of the table vegetables which are most appreciated, but also plenty of fresh salads and a sufficiency of herbs. In large kitchen gardens fruit (*see* Fruit) is generally associated with vegetables, trees being grown alongside the paths, and also on the walls. The fruit and plant houses are generally put in the kitchen garden. In very small establishments, where the space for vegetables is limited in area and is near the house, it may be well to omit the coarser winter Greens, partly because they take up room which could be better devoted to choice things, such as Asparagus, Seakale, Celery, Cauliflowers, spring Cabbages, and salads; and partly because their odour is disagreeable in wet weather. Where there is a fair amount of ground available the kitchen garden may be separated from the house by flower gardens and shrubberies. Shelter of some kind is desirable. A high, strong wall is the best, not only because of the complete shelter which it provides, but also because it is capable of supporting lean-to and hip-roofed greenhouses, vineries, and other glass structures, and fruit trees. More-

KITCHEN GARDEN—*continued.*

over, wide borders can be made on the inner side, and those with south and west aspects will be favourable for early crops. Failing the wall there must be a hedge of Quick, Privet, Hornbeam, or Beech; or a fence.

Paths.—Substantial paths are desirable, and the best are made with 6 ins. of rubble well rammed in with clinkers and surfaced with 2 ins. of gravel. They should slope from centre to sides to carry off water.

Soil.—The soil should be cultivated deeply and manured liberally. An excellent plan is to take one strip at a time and bastard-trench it—that is, take off the top soil to the full depth of a spade, break up the soil underneath to the depth of a spade or fork, put on manure and any garden refuse, and replace the top soil. In the case of light land this may be done in autumn if convenient; in the case of heavy land in winter after frost. If the soil is stiff and the site low it ought to be drained (*see* Drainage). The top soil may be left lumpy, and the late frost will crumble it. It can then be raked down fine for sowing in spring.



GROUND AFTER TRENCHING.

5. Top soil (note how the level is raised).
6. Subsoil broken up and manured.
7. Third spit broken up.

Manure.—Decayed stable or yard manure at the rate of 2 barrow-loads per square rod, or 30 loads per acre, will be good. Light, shallow, dry soil is improved by green manuring—that is, sowing Mustard at the rate of 2 lb. per square rod on ground that becomes vacant in summer, and digging it in during autumn; or winter Tares may be sown at the rate of 1½ lb. per rod in autumn and dug in in spring. A quarter of a pound each of basic slag (superphosphate for preference on limestone soil) and kainit per square rod may be turned in with the dung.

Cropping.—Many gardeners arrange for a rotation of the annual crops, using different crops on one piece of ground in successive years. It is feasible to have a perfect four-course rotation if the different classes are grown in the same quantities, but not if one class is grown in much larger proportions than another. Given equal proportions the following might follow each other in successive years: (1) Potatoes; (2) Peas, Beans, Celery, and Leeks; (3) Beetroot, Carrots, Parsnips, Salsify, and Scorzonera; (4) Greens and Onions. A tap-rooted crop is a good succession to a fibrous-rooted one. Ground may be heavily manured for Peas, Beans, Celery, Leeks, Greens, and Onions, but not for Potatoes, Beetroot, Carrots, Parsnips, and Tomatoes. Intensive culture provides for quick successions of vegetables, and may be considered in connection with French Gardening (which see).

Special remarks on the culture of all the principal vegetables, salads, and herbs are appended.

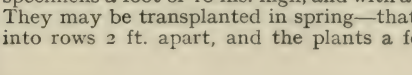
Artichoke.—There are two distinct kinds grown in gardens,

namely, the Globe, and the Jerusalem; a third—the Chinese—is seen occasionally. The Globe Artichoke (Cynara Scolymus) gets its popular name from the large, globular flower-heads, which are cooked and eaten with sauce. They are produced throughout the summer. The plant is a hardy perennial, and dies to the root in the autumn. The large Green Globe is a good variety. *Propagation :* To get a stock of plants, in the first place seed is sown in spring, heat being given if it is desired to push the plants on rapidly, but not being otherwise necessary. The seedlings can be thinned, and a year later put out in rich soil 4 ft. apart. Subsequently the stock can be increased by taking off suckers in April, and it is well to do this every 2 or 3 years, as old plants soon get worn out. *Soil :* Plant in deep, well-manured soil, as the plant is a gross feeder. Ashes may be heaped round the plants in autumn. Chards are the young growths that push as a result of cutting down the Artichokes in July, after a crop of heads has been taken; they are blanched with straw when 2 ft. high. The Jerusalem Artichoke (Helianthus tuberosus) produces tubers, which form the edible part. They do not contain starch, and their close texture, not less than their somewhat earthy flavour, renders them unpalatable to many. The plant is a strong grower, and should be planted at the end of the garden, where it will not interfere with other crops, and where it will also form a wind-break. *Propagation :* By tubers about 1 oz. in weight, planted 6 ins. deep, and 18 ins. apart, in rows 3 ft. asunder, in spring. *Soil :* A light, well-drained, poorish soil is best if the crop is grown for home consumption; deep, rich, moist soil may yield a heavier crop, but the produce will be coarse. The tubers may be lifted in November and covered with straw and soil similarly to Potatoes. The Chinese Artichoke (Stachys tuberifera) has small, corkscrew-like tubers of agreeable flavour, by means of which it is increased. They may be planted 9 ins. apart, in rows 18 ins. asunder, in spring. They like a well-drained, warm soil, but not a great deal of manure, which causes coarseness. The crop may be lifted and stored in sand in the autumn.



The Chinese Artichoke (Stachys tuberifera).

Asparagus (Culinary).—Asparagus officinalis is one of the most delicious of all garden vegetables, and as it is much more easily and inexpensively grown than many people suppose, there is no reason why it should not be grown in nearly all gardens. Special raised beds are only necessary in heavy, damp soil. *Propagation:* By seeds, which may be sown in April in well-pulverised soil, in drills a foot apart. If the plants come very thickly they may be thinned, and then, by the end of the season, they will be sturdy little specimens a foot or 18 ins. high, and with a nice mass of fibrous roots. They may be transplanted in spring—that is, a year from sowing—into rows 2 ft. apart, and the plants a foot asunder. In another



An Asparagus Knife.

KITCHEN GARDEN—*continued.*

year they may be transplanted to the beds. *Soil :* Asparagus likes a friable, well-drained, warm, loamy soil. It will thrive in clay when well drained and pulverised. Mortar rubbish and road sweepings will improve it. The ground should be deeply cultivated, and liberally dressed with decayed yard manure. Only moderate success may be expected on thin soil overlying chalk, unless the chalk be broken up, and the ground deepened by manuring, and mulching with manure, wood ashes, and leaf mould. *Forming beds :* In the olden days very elaborate beds were prepared for Asparagus. The soil was excavated, and in the pit thus formed faggots were laid, which were covered with roots and garden refuse. The soil, heavily manured, was put on this foundation. If the ground is drained with pipes this is unnecessary, even in the case of clay, as there is little fear of the soil becoming sour through the accumulation of stagnant water. In undrained clay it would be a wise precaution to adopt some such plan. To make a pair of beds proceed as follows: After preparing the soil mark out two strips 4 ft. wide each, with a 2-ft. strip between them. Throw the soil from the 2-ft. strip to the depth of a foot right and left. The alley thus formed will serve as a path, and the soil thrown out will deepen the soil of the beds. *Planting :* Asparagus may be planted any time in April. It does not matter if growth has started, so long as the roots are not allowed to get dry; the latter is very bad, and throws the crop back seriously. If it is desired to get a bed more quickly than can be done from seeds, roots should be purchased from a nurseryman or seedsman. These three-year-old plants will be of a suitable strength. A 4-ft. bed will accommodate 2 rows of plants, which may be inserted triangularly instead of exactly opposite to each other in parallel rows. The clumps may be a foot from the edge of the bed, and 18 ins. apart. They consist of a central crown and a mass of large fibres, which may be spread out and covered with 4 ins. of soil. *Summer culture :* The bed should not be cut from the first year, but growth encouraged by frequent hoeing, which will serve the double purpose of aerating the soil and keeping down weeds. *Autumn treatment :* The growth will ripen off in October, and at the end of that month it may be removed, and the bed top-dressed with short decayed manure, or (and preferably in the case of damp soil) with burnt refuse. Near the sea, seaweed may be heaped on the beds. *Spring dressing :* A spring dressing consisting of 3 oz. of superphosphate and 1 oz. of nitrate of soda per square yard will do good; or common salt may be applied at the rate of 4 oz. per square yard. *Cutting :* Heads may often be cut in April, and in May cutting will be general. It should cease at the end of June. An Asparagus knife will be found useful for the purpose. It consists of a short handle, a long piece of round steel, and a short, toothed blade which severs the stem when thrust into the ground. The heads are ready to cut when a brownish-green knob about 2 ins. long, and as thick as a finger, protrudes through the soil. The head should not be left till it is several inches long and the scales are bursting. *Large blanched Asparagus :* French growers secure very large blanched Asparagus by growing a giant variety in rich soil, and earthing it as

it pushes through the soil. Immense quantities are exported to Great Britain. It has only a small green tip, and is very wasteful if cooked in the ordinary way, as before the blanched part is soft the tender green tip is scattered. It should be cooked on end until the white part is soft, and only laid on its side to finish off the green tip. *Forcing :* An early crop of Asparagus may be secured by forcing. One plan is to place a light framework of laths over the bed and cover it with hot manure. Another is to make up a hot-bed, cover it with light, friable soil about 4 ins. deep, pack the roots in with a few inches of soil over them, and then place on a light. Where a heated pit is available the roots need merely be packed in soil, watered as required, and brought on in a temperature of about 65°. Where forcing is practised it is advisable to have a constant succession of roots coming on, so that the forced roots, which are greatly weakened, can be thrown away. *Asparagus beetle :* The greenish larvae of the Asparagus beetle (Crioceris Asparagi), do much harm by feeding on the young shoots and foliage; but the bluish beetle, which is about ¼ in. long, also feeds. If an attack is noticed, boil ½ lb. of soft soap in a gallon of water, stir in ¼ lb. each of soot and flowers of sulphur, dip the shoots in, and afterwards syringe. *Rust :* This fungoid disease sometimes blackens the foliage in summer. Before the attack has got far spray with Bordeaux Mixture (which see). *Varieties :* Connover's Colossal is very reliable. Early Giant Argenteuil is also good.

Bean.—In its different species, which vary greatly, the Bean is one of the most esteemed of hardy vegetables. The Broad Bean (Faba vulgaris) is hardy, but the Kidney Bean (Phaseolus vulgaris) is not, and the Scarlet Runner (Phaseolus multiflorus) still less so. Both of the latter are perhaps more valuable than the Broad Bean, certainly the Runner is, as in addition to more delicate flavour it crops much longer, lasting well into the autumn if frost permits. All the Beans like a deep, well-manured soil. The Broad Bean may be sown in November or March, the seeds being set singly 8 ins. apart. When they come into flower black aphides will attack the tips of the shoots, which must be broken off with finger and thumb below the point of attack and destroyed. The plants will not require sticks, but if the row is in an exposed place it may be well to drive in stakes every few feet and run two tiers of strong string along as a support. There are two classes, Longpod and Windsor, and there are white and green-seeded sections of each. Exhibition Longpod (white seed) is the most useful of all. The dwarf French or Kidney Bean should not be sown before mid-April, and the seeds may be dropped singly 6 ins. apart; if very strong growth follows the plants may be thinned. This Bean likes moist, fertile soil in a sheltered place. It must be picked regularly while the pods are young or it will be over quickly. Canadian Wonder and Superlative are two of the best varieties. There is now a climbing section, of which Tender and True and Princess of Wales are good representatives. The Scarlet Runner is the most useful of all the Beans, and in rich, moist soil, and with regular picking, it will keep on bearing for months. In hot, dry soil it often falls a prey to red spider. Early crops may be had by sowing seed in

KITCHEN GARDEN—*continued.*

boxes under glass in March and planting in June; or by wintering and planting old roots. It is rarely safe to sow seed out of doors before mid-May. The seeds may be set 9 ins. apart and given a 7-in. pole each. Soakings of liquid manure and a mulching of short manure will help the plants. Scarlet Emperor and Best of All are fine varieties. The White and Painted Lady Runners are not so much grown now as they used to be.

Beetroot (Beta vulgaris).—With the revival of Beetroot culture for sugar-making fresh interest has centred in a garden vegetable that had previously held only a modest position. Beetroot will grow in almost any soil, but does best in rather heavy, moist ground. Little manure is required in such land, and if the crop follows one for which the soil was well manured the previous year, such as Peas or Celery, none at all. Early sowing results in coarse roots, and it is best to defer it until May. If roots are wanted before September sow a round variety at mid-April. It economises seed and reduces the labour of thinning to drop three seeds in a cluster at every 9 ins., and these can be reduced to one later on. Cover 2 ins. deep. Birds must be kept away with tanned fish netting, black thread, or scares. The rows may be 15 ins. apart. In October the leaves should be removed without injury to the crowns, and the roots laid in a heap and covered with sand or with straw and soil. Good varieties:

Long.	*Short.*
Dell's Crimson	Globe
Cheltenham Green-top	

Borecole or Kale (Brassica oleracea acephala).—The Kales are the hardiest of all winter Greens, and it is not often that they are injured by frost, however severe. In the few seasons when injury is done a hard winter follows a mild autumn, which kept the plants green and soft too long. The Kales are grown in the same way as Broccoli and Brussels Sprouts, and the remarks made under those heads apply. Early April is a good time to sow. The curled Kales throw out small side shoots in mild spells all through the winter and spring, and these are the edible part. Some are ornamental as well as useful, having coloured foliage. The plants are subject to the attack of the enemies described under Broccoli, and are protected in the same way. Good varieties: Arctic, Asparagus, Dwarf Green Curled, Hearting.

Broccoli (Brassica oleracea botrytis asparagoides).—Broccoli is the winter and spring representative of the Cauliflower. It is nominally somewhat coarser and less pure white than the latter, but hardier. Broccolis may be had from October to June inclusive by making a suitable choice of varieties and sowing at different periods; but in mild districts Cauliflowers are preferred to autumn Broccoli. After Christmas Broccolis would take precedence of Cauliflowers. To get autumn and early winter Broccoli, seed should be sown out of doors at the end of March; to get late winter and early spring Broccoli, sowing may be practised at the middle of April; and to get late spring and early summer produce, seed may

be sown at the end of April. The following are good varieties for the various seasons:

Early.	Model
First of All	*Late.*
Self-Protecting	Late Queen
Midseason.	Methven's June
Leamington	

Many find the purple and white "sprouting" Broccoli useful. In all cases the seed should be sown thinly. Broadcast sowing is generally practised with greens of all kinds, but it is preferable to sow in rows a foot apart and hoe between the seedlings to keep weeds down. The seed should be sprinkled in very thinly, and the seedlings thinned if they begin to crowd each other. The seed may be covered with half an inch of soil, and the bed protected with tanned fish netting or black thread, otherwise birds will carry off the young plants. Showery weather in June or July should be taken advantage of to plant out 30 ins. apart. Firm, moderately rich soil is desirable. Broccoli and other winter Greens (*e.g.*, Brussels Sprouts, Savoys, and Kales), as well as Cauliflowers, are often planted between strong-haulm Potatoes, with the result that the Greens become drawn and flabby, in which state they are weak and easily injured by frost. One of the following precautions should be taken: (1) to plant between early, small-topped Potatoes only; (2) to set the rows of large Potatoes not less than a yard apart with the express object of accommodating the Greens; (3) to plant only between alternate Potato rows, and draw the tops of the Potatoes which are not intercropped away from the Greens on the other side of them. When the Potatoes are lifted the soil should be rammed hard round the Broccoli. When Broccolis have formed their hearts a leaf should be broken over them and left till they are cut. Club-root (Plasmodiophora brassicae); gall-weevil (Ceutorhynchus sulcicollis); and the caterpillars of the Large White, Small White, and Green-banded butterflies attack Broccolis and other Greens. Club-root causes large, ugly excrescences on the stem and roots, checking growth. Where prevalent fallow a piece of ground specially for the Greens, and lay on a coat of gas lime half an inch thick. Let this lie six weeks on the surface and then turn it in. Leave the ground another month before planting the Greens. Further, earth up the stems when the plants are half grown to encourage new roots. Gall-weevil causes small, marble-like swellings, which may be sliced off into a vessel containing a little paraffin when transplanting, and the roots drawn through a puddle of soot, lime, and water. The gas-lime treatment is also efficacious. The best remedy for caterpillars is to hand-pick the first comers, and then syringe the plants forcibly with water in which a little salt has been stirred. In cold districts it is common to grow the Broccoli in rows running east and west, and when severe weather approaches to take soil from the north side of the row and force the plants over to that quarter until they are nearly flat. This prevents the sun striking on the heads while they are frozen, and prevents severe injury.

KITCHEN GARDEN—*continued.*

Brussels Sprouts (Brassica oleracea bullata gemmifera).—In autumn and winter few of the coarser vegetables are more appreciated than Brussels Sprouts, and when well grown a few rows will give a supply for several weeks. When an early crop is wanted seed is sometimes sown in August, but for the principal supply the seed is sown out of doors in the first half of April. The seed and seedlings may be treated similarly to Broccoli and the same remarks apply. In autumn a few of the leaves should be cropped back to stumps in order to check growth and encourage the production of sprouts; but it must not extend to all the leaves at once, or a good deal of sap will be thrown back on the stems and the resulting shoots will be loose. The top or crown growth should be left intact. Each stem ought to become well clothed with sprouts by mid-autumn, and these can be picked as required. In the case of rich, moist soil, which favours gross growth, the larger varieties, such as Aigburth and Exhibition, should be avoided, and smaller kinds like Dwarf Gem and Northaw Prize selected instead; but for poor ground strong varieties had better be chosen. Exhibition is one of the best. A Cabbage-Brussels Sprout is now procurable, and it is a highly promising vegetable, as in addition to the sprouts on the stem the plant produces a nice Cabbage at the top in place of the loose cluster of leaves which distinguishes the ordinary Brussels Sprout. Brussels Sprouts are attacked by the same enemies as other members of the Brassica tribe. *See* remarks under Broccoli.

Cabbage (Brassica oleracea capitata).—One of the most useful of all the Green vegetables, and particularly valuable in spring, when good hearts take the place of Brussels Sprouts and Savoys and supplement Broccoli. A Cabbage bed should be formed in every kitchen garden in spring. Seed should be sown early in August, but it is a good plan to make two sowings, one a fortnight earlier. The seed may be sown thinly in a reserve bed of fine soil, and covered about half an inch. If birds are troublesome protect the seed bed with fish netting. Thin the plants if they become crowded during September. Towards the end of that month, or by the middle of October, plant the young Cabbages out 18 ins. apart. A piece of ground must be chosen from which a summer vegetable has been cleared, and an Onion bed is good, because the ground is both fertile and firm. Directly the ground is dry enough to be trodden on in late winter run the hoe between the plants, and sprinkle nitrate of soda or sulphate of ammonia among them at the rate of 1 oz. per square yard, taking care to keep it off the leaves. If the soil is loose it should be rammed firm. Should any plants throw up flower stems they should be pulled up and thrown away at once; but there will not be much trouble on this score if suitable varieties are sown. The following are reliable:—

Early Offenham	Emperor
Ellam's Early	Flower of Spring

Cabbages may be had in summer and autumn by sowing in March, April, and May, and transplanting when about 4 ins. high. The following are good varieties for this purpose:—

Defiance	No. 1
Improved Nonpareil	Imperial

When cutting Cabbages the stem should not be removed with the heart, because if left small secondary Cabbages will form on it. The principal enemies of Cabbages are club-root, gall-weevil, and caterpillar. For remedies, *see* under Broccoli. Cabbages for pickling should be sown out of doors in August and transplanted in autumn; they will then make close, firm hearts in July of the following year. Early Dwarf Red is a good variety. Chou de Burghley is a hybrid Cabbage of good flavour which may be sown in spring and transplanted 2 ft. apart. Couve Tronchuda, or Braganza Cabbage, is grown for the thick midribs of the large leaves, which make a good substitute for Seakale. Sow in spring and transplant 2 ft. apart. Coleworts may be sown in late spring. The Rosette is good.

Capsicum and Chili.—These are mostly grown in gardens for their ornamental fruit. The Cayenne, which has long, narrow, red fruit; and the Mammoth Red Chili, which has large fruit, are the best known. There are varieties with yellow, scarlet, crimson, and coral fruits. The Long Red Capsicum is used in pickles. The best method of culture is to sow in heat in spring, prick off, and subsequently pot singly.

Cardoon (Cynara Cardunculus).—The Spanish Cardoon is much esteemed by Continental cooks, who use the midribs of the leaf and the stem in soups and stews. Except in damp soil the plants should be grown in trenches like Celery. They may be raised from seed sown in heat in March or out of doors in a warm border in April. They should be planted 18 ins. apart and given abundance of water. In August the stems may be drawn together, tied, and earthed so as to exclude light and air, and left for two months, when they will be blanched and ready for use.



Large and Small Carrots. A point in soil management. 1. Small root in shallow soil. 2. Subsoil broken up; larger roots follow.

Carrot (Daucus Carota). — Carrots thrive best in sandy, friable soil, and should only be put on heavy, wet land when there is no other alternative. In such a case it is a good plan to grow them on ridges a foot high. The ground should not be manured heavily, and if it can be arranged for the crop to follow Peas or Celery, for which the ground was well done, no manure will be needed. It is a good plan to draw drills 15 ins. apart and to half fill them with crushed oyster shell and wood ashes in mixture. The seed may then be sown thinly and covered with an inch of soil. From mid-March to mid-April is a good time to sow, choosing a period when the soil is dry enough to crumble up readily. Thin early, and press the soil firmly round the plants left to exclude the Carrot fly, whose grubs are very destructive. A further preventive is to moisten some

KITCHEN GARDEN—*continued.*

sand with paraffin oil and sprinkle it among the plants. Lift in October and store similarly to Beetroot. Good varieties—

Short.	*Long.*
Early Gem	James's Intermediate
Guerande	St. Valery

For forcing or frame culture the Parisian may be selected. *See* French Gardening.

Cauliflower (Brassica oleracea botrytis cauliflora).—One of the most delicious and esteemed of all Green vegetables, Cauliflowers are in season from June to November inclusive, but crops can be got in early summer by sowing the previous autumn, or in heat in winter. Autumn crops may be secured by sowing thinly in a reserve bed out of doors in April, covering with half an inch of soil, screening with tanned fish netting to keep off birds, and transplanting after rain during June or July. It is important that young Cauliflowers should not be crowded in the seed bed, and if they get too thick in spite of thinning it is wise to set them out 9 ins. apart in a reserve bed until their permanent quarters are ready. Small varieties should be planted 2 ft. apart ultimately, and large ones 2½ ft. asunder. The ground should be dug deeply and manured liberally. Decayed farmyard manure is good, and light dressings of nitrogenous fertilisers (*see* Cabbage) may be given when the plants are in full growth. It is often convenient to plant autumn Cauliflowers between Potatoes, but they should not be overgrown by the latter. With respect to autumn sowing, it is best done in a frame at the end of September, although in the absence of glass a sowing out of doors early in that month may be tried. Frame-raised plants should be put out in April. By sowing seed in heat in January, pricking out the seedlings in boxes, and hardening in an unheated frame in March, Cauliflowers may be got ready for planting in April. All classes of Cauliflowers do badly in poor, dry, shallow soil. They like moist, fertile ground. The following varieties are good:—

Early.	*Late.*
Early Erfurt	Autumn Giant
Early London	Pearl
Purity	

For enemies, *see* under Broccoli.

Celery (Apium graveolens).—Delicious as a relish, excellent when cooked, and with the property of relieving rheumatic sufferers, Celery is a valuable crop. It benefits the whole garden indirectly, as the deep cultivation and thorough tillage entailed in its culture are good for succeeding crops. The trench system is convenient, as it allows of abundant watering and liquid manuring, and provides plenty of earth for blanching, but it is not indispensable. Nice crops of Celery may be had by planting between Potatoes. For early crops the seed should be sown in heat in February, for later rows in a cool house in March. The plant grows very slowly in its

early stages, and does not therefore demand much room. When, however, the seedlings begin to crowd it is a good plan to make a reserve bed with a little manure covered with 3 or 4 ins. of soil, and fix a glass sash over it until the weather becomes mild. If ground is very limited the trenches need not be made till an early crop, such as Peas, is finished. They may be cut 8 ins. deep, dressed with decayed manure, and surfaced with a little of the fine top soil. Planting is best done a foot apart after rain in June or July. Shade in hot sunshine until the plants are growing. Soakings of water, varied with liquid manure and dustings of soot, will do good. Should maggots make grey lines in the leaves, pinch the affected parts and spray with paraffin oil and soft soap (*see* Paraffin) in solution. When the plants are a foot high draw the stems together, tie them, and earth up partially, finishing in October. In hard weather spread some litter over the tops. Good varieties: Standard Bearer, red; Sulham Prize, pink; Wright's Giant, white. The Turnip-rooted Celery is a good vegetable and useful for soups and stews. It may be raised from seed in spring and planted a foot apart on level ground in early summer.



Blanching Early Celery with Brown Paper.

Chicory (Cichorium Intybus).—Grown mainly for salads in this country, the seed being sown outdoors late in spring in rows a foot apart and the plants thinned to 9 ins. asunder. Roots are formed, which are lifted in autumn, pricked in soil in boxes and kept in a dark place. The blanched leaves which push constitute the salad. The Witloof Chicory is extensively forced on the Continent, particularly in Belgium, for yielding Seakale-like stems, which are cooked and form a delicious vegetable.

Corn Salad or Lamb's Lettuce (Valerianella olitoria).—A useful salad which may be had in winter by sowing in September in friable soil on a sheltered south border. Sowings may be made at intervals in spring and summer if earlier supplies are wanted.

Cress (Lepidium sativum).—The plain and curled forms of Cress are largely used in association with Mustard as salads and flavouring; the curled is also used for garnishing. The seed may be sown 4 days earlier than Mustard to allow for its slower growth. The seed should be sprinkled thickly on the surface of fine, level soil in the open or in boxes under glass; or on flannel stretched tightly on a wire frame and with one end dripping in water. The American Land Cress is neglected in Great Britain, but it is very useful, as it may be grown from seed in spring, and will yield continuously for a long time in summer. The flavour is brisk and pungent. Water-

KITCHEN GARDEN—*continued.*

cress is not generally cultivated, and when established in a stream grows without attention other than picking. It may be raised from seed.

Cucumber (Cucumis sativus).—Few relishes are more appreciated than the Cucumber, and those who like it generally contrive to have a long supply of tender fruits by sowing successionally in winter and spring. A healthy plant that is kept growing by the maintenance of a humid atmosphere will bear a prodigious quantity of fruit, but a plant that is allowed to struggle along in a hot, dry atmosphere will soon go out of bearing and lose its colour. One firm seed may be placed in a small pot and stood on a hotbed or in a warm house in January, February, or March, or successionally. If to be grown in a house, make up mounds of lumpy loam on slates on the greenhouse stage so that the plants are near the glass, and train the growths on wires strained about a foot below the glass. Allow enough laterals to extend to cover the glass, but not more, breaking out shoots where necessary to prevent crowding. When roots show at the top of the mounds add fresh, warm soil. Give water as needed, and damp down frequently to maintain humidity. Give weak liquid manure twice a week while the plants are in full bearing. Cut the fruits young. For frame culture make up a hotbed of manure and leaves, trample it well down, and put in mounds of soil, one under each light. Spread the shoots over the bed as they grow to prevent crowding. Syringe and water to maintain a moist atmosphere. Good crops of Cucumbers may be grown outdoors by planting early in June between Pea rows or in some other vacant spot where the soil is rich. Water and liquid manure should be given in dry weather, otherwise the plants will be attacked by red spider, which is the worst enemy of Cucumbers. Canker sometimes attacks the stems of plants under glass; the most common cause is close, wet soil. Always use coarse, lumpy soil. Rub in sulphur at once if an attack is seen. If the plants collapse from no external cause, eel-worm may be suspected. Remove plants and soil and make a fresh start, using soil which has been well scorched. Good varieties: Lockie's Perfection, Matchless, Stockwood Ridge (for outdoors).

Dandelion (Taraxacum officinale).—The common Dandelion is, of course, a weed; but the forms selected by seedsmen are well worth growing in order to provide a component for salads. The method of culture is to sow the seed in drills a foot apart in April, thin the plants till they stand clear of each other, and let them grow until autumn, when the roots are lifted and stored. They may be forced at intervals in a dark place throughout the winter in the same manner as Seakale.

Egg Plant (Aubergine) (Solanum esculentum).—These interesting relatives of the Potato are grown in the larger gardens more, perhaps, for ornament than use, although in France the fruits are cooked. They are tender plants, and although they can be grown out of doors during the warmest part of the year they are best under glass. The seed should be sown on a hotbed or in a warm house in February or early March, the seedlings pricked off into boxes, then put singly

in small pots, and finally shifted to 6-in. pots. They will appreciate liquid manure when the fruit is swelling. For the rest, attention to watering, warmth, and occasional syringing are the principal requirements. Purple, scarlet, and white-fruited varieties are procurable.

Endive (Cichorium endivia).—One of the most useful of salads, as it is easy to grow, fairly hardy, and of nice flavour, the touch of bitterness which distinguishes it from Lettuce being agreeable rather than otherwise. A great thing in favour of Endive is that it can be had in use in autumn, winter, and spring, and where salads are much in request it should be sown successionally in spring and summer. It requires substantially the same treatment as Lettuce, namely, a friable, fertile soil, thin seeding in a spare plot, transplanting when 2 or 3 ins. high and quite sturdy to rows 15 ins. apart, and finally blanching. The first outdoor sowing may be made in April, and thereafter pinches of seed may be sown at intervals until the end of September. The plants from the earlier sowings will come into use in summer and autumn, those from the late ones in winter and spring. The latter should be made, and the plants put out, on a warm, sheltered border. They pass most winters in safety, but as their numbers are liable to be reduced in a severe one, as many as accommodation can be found for should be lifted in autumn and planted in an unheated frame. These will come in during late winter or early spring, and those left out will be ready, if they survive, early in summer. The summer and autumn plants may be blanched in the same way as Lettuces, namely, by tying the outer leaves up, but not tightly. The winter and spring plants may be lifted and put in a dark place. The two most useful varieties are Broad (Round) leaved Batavian and Green Curled. The former is the more useful, because if abundant it can be used as a vegetable for cooking. It is, moreover, easy to blanch. The Green Curled makes a more graceful salad, and needs less space.

Garlic (Allium sativum).—A white-bulbed member of the Onion tribe, which is generally treated in the same way as Shallots, *i.e.* bulbs are planted in late winter about a foot apart, and lifted and ripened in summer.

Gourd (Cucurbita).—The Gourds and Pumpkins are closely related to Vegetable Marrows, and the culinary varieties may be grown in just the same way (*see* Vegetable Marrow). But some gardeners prefer to limit their attentions to the ornamental varieties, and to grow these over arches. They vary greatly in shape, and the colours are brilliant. The seed may be sown in a frame or house in spring and the plants put out in June.

Herbs (Sweet and Pot).—The good housewife makes ready use of kitchen-garden herbs, whether for soups, flavouring, garnishing, or medicinal purposes. The most useful are the following:—

Angelica (*s*)	Chervil (*s*)
Balm (*p*)	Chives (*p*)
Basil, Sweet and Bush (*s*)	Dill (*s*)
Borage (*s*)	Fennel (*p*)
Chamomile (*p*)	Horehound (*p*)

KITCHEN GARDEN—*continued.*

Hyssop (*p*)
Lavender (*p*)
Marigold, pot (*s*)
Marjoram, pot (*p*)
Marjoram, Sweet (*s*)
Mint (*p*)
Pennyroyal (*p*)
Rampion (*s*)
Rosemary (*p*)
Rue (*p*)
Sage (*p*)
Savory, Winter (*p*)
Sorrel (*p*)
Southernwood (*p*)
Tansy (*p*)
Tarragon (*p*)
Thyme, common (*p*)
,, Lemon (*p*)
Wormwood (*p*)

The simplest plan of growing all those marked (*p*) is to buy roots and plant them in well dug and manured soil early in April, but seeds of several are procurable and may be sown in spring if preferred. Mint spreads rapidly at the root, and should be divided every 3 or 4 years. Those marked (*s*) are generally raised from seed in spring, sowing in drills a foot apart on light, friable soil in a sunny spot. The herbs for drying should be gathered when mature, and laid in a dry, shady place. When dry they may be stored in paper bags. The uses of the various herbs may be briefly indicated as follows:—

Angelica.—Cooking and candying, seeds for flavouring
Balm.—Tea and wine
Basils.—Flavouring
Borage.—Flavouring drinks, also for bees
Chamomile.—Medicinal
Chervil.—Salads, garnishing
Chives.—Salads, flavouring
Dill.—Flavouring
Fennel.—Garnishing, sauces
Horehound.—Medicinal
Hyssop.—Pot herb, medicinal
Lavender.—Perfume
Marigold.—Flavouring
Marjoram.—Flavouring
Mint.—Flavouring
Pennyroyal.—Tea
Rampion.—Winter salads
Rosemary.—Tea, oil
Rue.—Medicinal
Sage.—Flavouring
Savory.—Flavouring
Sorrel.—Salads
Southernwood.—Perfume
Tansy.—Garnishing
Tarragon.—Salads, flavouring
Thyme.—Flavouring
Wormwood.—Medicinal

Horseradish (Cochlearia Armoracia).—Well known as a relish and component of sauces, which are enlivened by its pungent flavour. The plant is a rank grower, and unless kept under control may become a nuisance. A few thongs should be planted in a small bed in spring, and when the plant begins to spread it should be replanted. One very good plan, as tending to keep the crop well in hand, is to plant diagonally in the sides of a small ridge of soil made up over a rich coat of manure.

Leek (Allium porrum).—The popularity of the Leek tends to spread southward, and it is becoming as great a favourite with English as with Scotch gardeners. Its advantages are threefold: it is easily grown, it is suitable for following early crops, it is hardy. It answers well to Celery culture, and fine specimens are got by

sowing under glass and planting in trenches; but useful table produce is secured by sowing out of doors on a spare plot in spring and planting with a dibble in June. It must be earthed if white stems are wanted. The crop may be left in the ground unprotected in winter. Good varieties: Musselburgh, The Lyon, Prizetaker.



PLANTING LEEKS.
1. Drill. 2. Plant in hole.

Lettuce (Lactuca sativa).—The most popular of all salads. With the number of good varieties now available there is no difficulty in getting a long supply of crisp, nutty Lettuce over the greater part of the year. The plant will grow in almost any soil that is reasonably fertile, and nice hearts may often be got from ground that would otherwise be wasted—space between Pea rows, for example, or on the ridges of soil that result from making Celery trenches. The one serious trouble with Lettuces is what gardeners term "bolting," that is, running to seed prematurely. This spoils the plant for edible purposes. It is more common with the upright ("Cos") varieties than with the dwarf ("Cabbage") section, and a reliable, non-bolting variety, such as Favourite or Continuity, should always be grown as a stand-by. However, there is not, as a rule, much trouble from bolting with the Cos sorts if they are grown unchecked from the first, and put out in moist soil. A light coat of bone flour or superphosphate, say 4 oz. per square yard, spread on and forked in before planting, will help them to form hearts. The ground should be dug deeply, and a dressing of decayed manure turned in during the process. *Sowing:* The first sowing of seed may be made in a cool house or frame in winter. If Lettuce is in great demand, and there is a frame or pit available, the seed may be sprinkled over it broadcast, and the plants thinned to a few inches apart. When they have grown a little some may be drawn unhearted and used, while the others are left to mature. Otherwise, the seed may be sown thinly in boxes, and the plants put out in April. Seed may be sown outdoors on a warm border early in March, but in exposed places the end of the month will be early enough for safety. The soil should be dug, crumbled, raked fine, and drills drawn a foot apart and about half an inch deep. The seed germinates quickly if the ground is moist, but not sodden, at sowing time. If the seedlings come quickly they should be thinned, and when the plants begin to crowd each other again they should be planted out a foot apart after showery weather; very large varieties, like Giant White Cos, may be given more room. When the plants are fully grown the hearts should be blanched by tying the outer leaves up just above the centre with a strip of raphia. They should be tied firmly, but not drawn tightly, or the hearts may rot. "Bolting" is known by the plants throwing up a shoot from the centre instead of remaining firm. It is useless to preserve plants which betray this weakness, but those who like cooked Lettuces need not waste them, even though they may have no pets.

KITCHEN GARDEN—*continued.*

such as rabbits, to give the plants to. Where Lettuces are in great demand it is well to sow little and often, so as to maintain a regular supply of young plants, some of which will always be hearting in. To make one or two large sowings with the object of maintaining a regular supply is a bad principle, as the plants come in together in large quantities and will not keep. A final sowing may be made outdoors about mid-August. The plants thus raised will be set out a foot apart in autumn to stand the winter, which they will do most years if a hardy variety is chosen. *Varieties :* Paris White and Giant White are two reliable Cos varieties, with Hicks' Hardy White and Black-seeded Bath to sow in August. Favourite and Continuity are splendid Cabbage varieties. Those who force Lettuces (*see also* French Gardening) should note the following sorts: Romaine Cos, Acquisition Cabbage, and Improved Chavigny Cabbage. Noire Parisienne is also good.

Maize (Zea Mays).—Maize or Indian Corn is not grown to any extent in Great Britain, because the climate does not permit of ripening it. The crop is an important one in the United States. An early sugar corn should be grown, the seed being sown in a warm house or frame in spring, the plants hardened and put out 2 ft. apart in June.

Mercury (Chenopodium Bonus-Henricus).—A hardy vegetable which is grown a good deal in Lincolnshire, but is not of any special value. It may be sown out of doors in spring.

Mushroom (Agaricus campestris).—Although the Mushroom is not a vegetable, but a fungus, it is generally included in kitchen-garden crops, and often occupies, for part of the year, frames that are utilised for other things at earlier or later periods. In large establishments a " Mushroom house " is not an uncommon adjunct to other horticultural buildings, and this consists of a thick-walled, dark place, with pipes running through it. But Mushrooms are often grown in sheds, and still more largely in the open air. Heat and darkness are the two principal requirements, and with abundance of fresh stable manure at command there is no difficulty in getting sufficient warmth outdoors. The manure must be well turned and shaken out on 3 or 4 successive days in order to sweeten it. When fresh from the stable it heats violently, and the gases emitted are foul, but after repeated turnings the heat becomes subdued and the material pleasant to the nostrils. At this stage it should be built into a firm bed 30 ins. wide at the bottom, sloping up to 6 ins. at the top. The manure must be briskly trodden in order to get it quite firm. When the bed is finished a thick stick should be thrust in here and there and left for a few hours, then drawn out and tested for heat with the hand. If very hot wait a day. At the second testing the stick may be still hotter, in which case wait another day. Not until the heat of the stick can be borne should the bed be spawned. Seedsmen supply spawn in flat cakes or " bricks," which should be broken up into pieces about the size of eggs and thrust far enough into the bed to be hidden. The bed should then be plastered completely over an inch deep with moist, loamy soil, and finally covered with about a foot thick-

ness of straw. White threads will run from the spawn, form Mushrooms, and pierce the soil, growing above in thick clusters, from which they should be broken as they become large enough for use. When grown under cover less manure and straw will be needed, as the necessary heat and darkness can be secured with a smaller quantity of the materials.

Mustard (Sinapis alba).—A popular salad or relish, generally associated with Cress. It may be grown in the same way. *See* Cress.

Onion (Allium cepa).—As a component of soups and stews the Onion is admittedly almost indispensable, and cottagers at all events give it a wider use, not hesitating to promote it to the rank of a major vegetable, nor even to eat it raw with bread and cheese and the particular beverage which they favour. For salads a white, mild variety should be chosen and sown in August; another sowing may be made in spring. It is customary to sow a larger, stronger-flavoured sort at the same time in summer, and transplant in autumn or spring to yield large bulbs before the spring-sown crop is ready. Varieties so treated are classed as "Autumn Onions." For the main crop it suffices to sow when the ground becomes dry enough to crumble in March or April. A piece of soil is dug deeply and manured liberally. The surface is crumbled up, dusted with soot, and then trodden quite firm. A little soil for covering is scratched up with the rake, and the seed is sown thinly in lines a foot apart. After sowing the seed is covered, the bed well trodden, and the surface lightly raked over. The plants are subsequently thinned till just clear of each other; severe thinning is avoided except for prize bulbs. It is well to spray the plants with soft soap and paraffin oil in solution (*see* Paraffin oil) when they are 2 or 3 ins. high, in order to keep off the Onion fly, which otherwise will lay eggs on the leaves in May, and grubs, hatching therefrom, will work their way to the bulbs and destroy the plants. Thereafter the plants will grow steadily until mid-June or July, when they are subject to the attack of a mould or mildew. This must be checked at the first trace by spraying with liver of sulphur, ½ oz. per gallon of water. In August the tops may be broken over to check growth, and a fortnight later the bulbs may be pulled up and left in the sun to dry. When fully ripe they may be strung together and hung up in a dry, cool shed. *Useful varieties :* A 1, Ailsa Craig, Bedfordshire Champion, James's Keeping, White Spanish. Potato or underground Onions are very useful, and are grown from bulbs in the same way as Shallots (*see* p. 212).

Parsley (Carum Petroselinum).—The housewife likes to have a row of Parsley in her garden from which to gather sprigs for garnishing her dishes, and there is no trouble in giving her what she wants every day in the year provided frame room can be found in winter; otherwise she may go short in spells of hard frost. Our seedsmen know well how greatly the feminine eye is pleased by beauty of form, and they have consequently given us varieties of Parsley that are beautifully curled. The seed of these may be sown in the open in March. The soil should be covered with decayed manure and then dug deeply, turning the manure well in. Four ounces of

superphosphate per square yard may also be dug in. The seed should be sown thinly, and covered with about half an inch of soil. The seedlings may be thinned to a few inches apart, and then left to grow, with the result that there will soon be a splendid row of Parsley.

Parsnip (Peucedanum sativum).—If not one of the most popular vegetables the Parsnip is certainly one of the most nourishing, and is worthy of culture in all kitchen gardens. The seed is light and soon loses its vitality; it should therefore be sown as early in spring as the state of the soil will permit. Ground that was cropped with Peas the previous year, or that has been cleared of Celery, will generally give a good crop of Parsnips without further manuring, but it is a good plan to dress the ground with soot and lime, which may be spread on at the rate of ½ lb. each per square yard and dug in towards the close of winter. When the ground is dry enough to crumble in March or early April, draw drills 18 ins. apart and an inch deep, sprinkle the seed in thinly, and cover. The plants may be thinned to 9 ins. apart. They ought to be ready for pulling in October, but they improve in flavour as the autumn wears on, so that there should be no hurry in removing them from the ground except in such quantities as are required for immediate needs. Parsnips are often attacked by a fungoid disease on the root, called "rust." Liberal dressings of soot and lime, and the avoidance of fresh manure, will keep it in check. A leaf-mining maggot sometimes attacks the leaves, and it should be met by crushing the affected leaves immediately and spraying with a solution of soft soap in which a wineglassful of paraffin oil has been stirred. The following are good varieties: Hollow Crown, Maltese, Student, Tender and True. The fourth of these is the best flavoured.

Pea, Green (Pisum sativum).—The Green Pea is one of the oldest of vegetables, but it did not come into general cultivation in Great Britain until the seventeenth century, and very little progress was made in the improvement of varieties until the beginning of the nineteenth, when Knight raised the first wrinkled-seed marrowfat variety. The number of sorts which combine delicious flavour with abundant podding is now considerable, and the Pea lover has a choice that is so wide as to be almost embarrassing. Some varieties pod early and some late, so that crops may be had over a long period. In early districts the first outdoor crop will be ready in June, and in late ones the last may be in use in November. The best crops are generally secured in July and August. Those who want an early crop and have no glass should choose a sheltered place with a south or south-west aspect, and sow as soon as the ground becomes crumbly after the end of February. It is a mistake to sow when the soil is sodden and pasty. Thereafter sowings may be made every 10 or 14 days until June. A warm border under a south wall will sometimes yield early Peas in 13 weeks, but often 15 are required. Later in the year, when the soil is warmer, crops can be secured in 3 months or less. The soil for Peas should be dug deeply or trenched (*see* Soil), and manured liberally (*see* Manures and Rotation cropping). In the case of heavy soil the seed may be covered 2 ins. deep, and in light 3 ins.

It is wise to make a wide drill with a draw hoe or other tool and sprinkle the seed well over it, making a pint go at least 20 yards. To avoid destruction by birds or vermin moisten the seed with paraffin oil before sowing, and when the plants come through place short twigs among them, and sprinkle fresh lime or soot about. In case of bird trouble at a later stage set up scares. The sticks for supporting Peas should be 18 ins. longer than the nominal height of the Peas, and forced well down after having the base sharpened, so that they grip securely. Six should be allowed per yard, three on each side of the row, and the ranks of sticks should not be set nearer than a foot of each other. String stakes and cord may be used for supporting Peas up to 30 ins. high, but sticks are better. Wire netting attached to iron rods or strong poles makes a very fair substitute for sticks. When young Peas are nicely through they may be thinned if crowded and earthed up with a couple of inches of crumbly mould. Where several rows are sown on the same piece of ground it is customary to sow them the same distance apart that the plants grow high, and the ground between may be cropped with Spinach, Turnips, or Lettuces. If weevil should attack the Peas they should be dusted with soot and lime in equal parts; and mildew should be checked at once with fresh liver of sulphur, dissolved in water at the strength of ½ oz. per gallon. The pods should be gathered young, and pods of different ages and varieties should not be mixed in a dish. If very large pods are wanted for exhibition, the plants should be stopped a foot short of their full height and liquid manure applied. When the crop is over, the plants should not be left on the ground to become a prey to mildew, but should be cut off just above the ground level and cleared away. The roots may be left in the ground, as they supply the soil with nitrates. The following are good selections of varieties:

Dwarf Early.
Little Marvel

Dwarf Medium.
Daisy

Dwarf Late.
Dwarf Mammoth

Three to four feet Early.
Gradus
May Queen

Three to four feet Late.
Gladstone
Michaelmas

Marrowfat Varieties of fine Flavour.

Duke of Albany,	5-6 ft.
Kaiser,	3 ,,
Peerless,	4 ,,
Record,	5-6 ,,

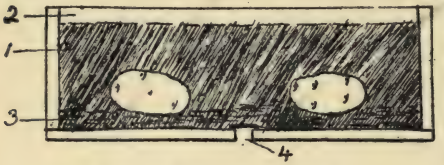
Large Exhibition Varieties.

Alderman,	5-6 ft.
Duke of Albany,	5-6 ,,
Matchless Marrowfat,	5-6 ,,
Prizewinner,	3 ,,
Quite Content,	5-6 ,,

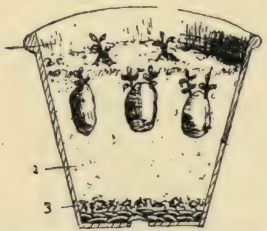
Potato (Solanum tuberosum).—Admittedly the most important of all vegetables, the Potato is also often one of the most disappointing, owing to its tenderness and liability to disease. Given warm, dry weather from April to August there is no cause for anxiety, but in a cold spring there is the fear of frost, and in a wet summer of blight. If there is a choice of site it is well to plant the first crop on

KITCHEN GARDEN—*continued.*

a sheltered south or west border in February, then it is possible to dig in May in mild districts. In cold, exposed places it is not prudent to plant before April. Potatoes will thrive in both light and heavy soils if friable, but damp sites should be avoided. The ground should be dug deeply and given a fair dressing of decayed manure, supplemented by 4 lb. of kainit and 3 lb. of superphosphate per square rod, applied in February, the whole turned well in. The drills for early varieties may be drawn 2 ft. and those for late ones 3 ft. apart, all 4 ins. deep, then with a light ridge of soil over all they will be covered 5 or 6 ins. The sets may be a foot apart. When the plants are 8 or 9 ins. high, soil should be drawn up to the tips. About the end of June the plants should be sprayed with Bordeaux Mixture (*see* Bordeaux), which should be got well under the leaves. Woburn Bordeaux Paste, a proprietary compound sold by seedsmen, may be used instead if more convenient. An Abol sprayer will be found a good and inexpensive appliance suitable for small cultures. For large cultures a knapsack sprayer is preferable. If the weather is damp and the temperature low at mid-July a second spraying should be given. The crop will be ready for lifting when the leaves, being free from disease, turn yellow; the period will vary with the sort and district. Early sorts are frequently lifted while the tops are green, but it is generally at the sacrifice of flavour and quantity. Tubers to be stored for future use should be allowed to lie in the sun until the skins are set, but no longer, otherwise they will turn green. In such a state they are good for seed but not for food. Seed Potatoes may be stored in a light place, but



FORCING POTATOES IN BOXES.
1. Soil. 2. Space for water. 3. Drainage material. 4. Hole for water to escape.



GROWING EARLY POTATOES IN POTS.
1. Space for water. 2. Soil. 3. Drainage.



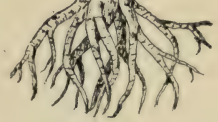
THE POTATO DISEASE (Phytophthora infestans).
1. Spots on the upper surface. 2. Diseased patches on under side. 3. Healthy leaf.

good tubers should be put in a heap when dry, and covered with straw and soil. All must be kept safe from frost. If very early Potatoes are wanted, tubers may be put in large pots and placed in a warm greenhouse, or planted in a frame. Those who grow Potatoes from tubers of their own saving should get fresh seed every 3 years or so, preferably from a different soil and district, otherwise it will be found that the crop deteriorates. Good varieties—

Early.	*Medium.*	*Late.*
Midlothian Early	British Queen	Factor
Sharpe's Express	Snowdrop	Up-to-date

Radish (Raphanus sativus).—The Radish presses the Lettuce hard for popularity as a salad and "relish." All classes appreciate it, and it is a "stock line" with market gardeners. It is a fairly hardy vegetable, and those who think a good deal about having a long supply sow in autumn as well as in spring. The first sowing of the year may be made in a sheltered place towards the end of February, in well dug and manured soil, the seed being sown broadcast an inch deep and the bed covered with tanned netting or black thread in order to keep off birds. Thereafter sowings may be made at intervals until September. Those who force vegetables in frames (*see also* French Gardening) frequently sprinkle a few Carrot and Radish seeds in mixture in rows, drawing the Radishes before the Carrots want much room; or they sow between frame Potatoes. The following varieties are good if drawn young: Turnip (red and white), French Breakfast, Wood's Frane. For forcing, Earliest of All.

Rhubarb (Rheum rhaponticum).—A good stool of Rhubarb is very serviceable, and those who have the necessary accommodation may grow several and force a portion, either by placing some litter or a bottomless box or barrel round the roots in the garden, or by lifting a few stools, packing them together in soil in a warm place and watering them. Thus a succession will be secured, as the unforced plants will come on later. In starting with Rhubarb, seed may be used and sown in spring, the plants being shifted the following spring; but sticks cannot be pulled under 3 years. Roots may, however, be bought, and if planted in good soil in spring will yield the following year; it is not wise to pull from freshly established plants. A cool, moist site should be chosen for this crop, and the soil should be manured liberally. Soakings of water, liquid manure, house slops, and soapsuds will strengthen it. Good varieties: Champagne (early) and Victoria (late).



A STRONG FORCING ROOT OF RHUBARB.

Salsify and Scorzonera.—Two minor roots, but quite distinct from the big crops, such as Carrots, Beetroot, and Parsnip, and of agreeable flavour. Salsify (Tragopogon porrifolium) has a cream-coloured root, and good specimens are 9 ins. long by 2 ins. thick at

KITCHEN GARDEN—*continued.*

the top; the foliage is slender, almost grassy. Scorzonera (Scorzonera hispanica) has a purple root rather larger and thinner than Salsify, and the foliage is broader. Both may be grown in the same way as other tap roots—that is, sown outdoors in deep, well-tilled, but not freshly manured soil, and covered an inch deep, in April. The rows may be a foot apart and the seedlings thinned to 6 ins. or rather more. They will be ready for use in autumn, and may be lifted and stored like Beetroot, but Scorzonera at all events is hardy enough to be left in the ground most of the winter if desired.

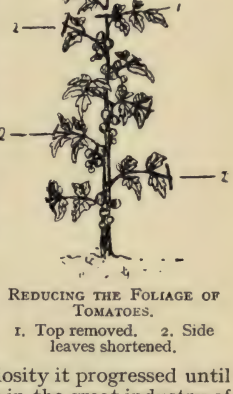
Savoy (Brassica oleracea bullata).—A hearting form of winter Green, with crinkled leaves, very hardy and useful. Savoys are in season from mid-autumn to the end of winter, when they give way to summer-sown Cabbages. Seed may be sown in April, and the plants treated similarly to Broccoli and Brussels Sprouts, except that the smaller varieties may be planted a little closer. They like firm, fertile ground. They should not be cut until the hearts are quite firm, or the flavour will be inferior. Savoys are subject to the same enemies as the other Greens (*see* Broccoli). The following are good varieties: Early Dwarf Ulm, Perfection, Drumhead (large). A Savoy-Brussels Sprout is now on the market.

Seakale (Crambe maritima).—One of the most delicious of vegetables when forced. The plant forms a tap root, which, if protected, will push up a thick white stem. There are various methods of forcing it, one being to heap soil or house cinders over the crowns in winter, another to pack in soil under the stage of a warm house, a third to cover the crowns with deep pots and heap hot manure over them, a fourth to place in a box in a warm room. Friable soil and plenty of moisture should be provided in all cases of forcing above ground. The plants are easily raised, and seed may be resorted to, sowing in spring; but 3 years may elapse before the crowns are strong enough to force. If, however, pieces of side root are taken, planted up to the tip 2 ft. apart in fertile, friable soil in spring, and the growths which spring from the crown thinned to one, strong forcing crowns will be formed by autumn of the same year. Lily White is an improvement on the common Seakale.

Shallot (Allium ascalonicum).—This useful member of the Onion tribe is worth a place in every kitchen garden, for it comes into use in early summer, and may be utilised in soups, stews, and pickles, as well as for plain cooking. It is usual to plant bulbs, as seed does not, as a rule, give a crop until the second year, although it sometimes does so the first. The bulbs should be planted as early in the new year as the soil comes into suitable condition for working, and may be half buried 9 ins. apart in rows a foot asunder. If the soil is deep and well manured they will speedily throw up a cluster of narrow leaves and presently begin to form offsets, which will develop into a large, closely packed cluster by midsummer, when they may be taken up and dried in the sun.

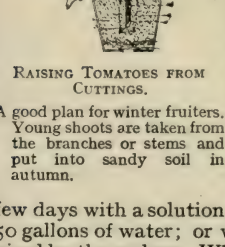
Spinach (Spinacia oleracea).—There are few more wholesome and healthful vegetables than Spinach, and its medicinal properties are well marked. All classes should grow it, either as a main crop or as a catch crop between Peas and Beans. It is hardy and easily

grown, and the one serious drawback to it is its liability to run to seed, which spoils it. The grower must look partly to varieties and partly to culture as a remedy for this. The ordinary "round" and "prickly" varieties (these names come from the character of the seed, not from the leaf) are both addicted to it, especially in hot, dry weather and in poor soil. The Long-standing and Victoria varieties are less prone. The New Zealand Spinach, which is quite different from the rest, is also a non-bolter. The soil for Spinach should be deep, moist, and fertile. In addition to the ordinary manure, bone flour or superphosphate may be dug in at the rate of 4 oz. per square yard. The first sowing may be made in February where there is a sheltered border available, and thereafter regular sowings may be made until September, covering an inch deep. If several rows are sown in one bed they ought to be 2 ft. apart, and the plants should be thinned to a foot apart. The Perpetual Spinach, or Spinach Beet, is useful, as it produces very large leaves.



REDUCING THE FOLIAGE OF TOMATOES.
1. Top removed. 2. Side leaves shortened.

Tomato (Lycopersicum esculentum).—No fruit or vegetable (botanically the Tomato is a fruit) developed in such an astonishing way during the last few years of the 19th century as the Tomato. From being little more than a botanical curiosity it progressed until it became one of the most considerable items in the great industry of market gardening. Hundreds of acres of glass houses are devoted to its culture, and it is grown in the majority of private gardens. A native of South America, the Tomato is a tender plant in Northern climes, and it is unfortunately liable to fungoid diseases, which are worst in cool, damp summers. This renders outdoor culture precarious. Much can be done to keep indoor Tomatoes healthy by growing them in sterilised soil, and where trouble from eel-worm, "sleepy disease," and other pests is persistent, it is worth while to go to the expense of sterilisation, which is effected by heating, either with steam or in a furnace. If the soil be steamed it should be heated to a temperature of 160°, and kept covered with a cloth during the process. The only disease that is likely to attack plants in sterilised soil is yellow spot (Cladosporium fulvum), and this can be kept under by spraying every few days with a solution of "bluestone" (sulphate of copper), 1 oz. in 50 gallons of water; or with Woburn Bordeaux Paste at the rate advised by the makers. When attacked by the dreaded "sleepy disease"



RAISING TOMATOES FROM CUTTINGS.
A good plan for winter fruiters. Young shoots are taken from the branches or stems and put into sandy soil in autumn.

KITCHEN GARDEN—*continued.*

the soil should be dusted immediately before watering with "Veltha," a proprietary compound sold by florists. It is a great aid to keeping indoor Tomatoes healthy to maintain a brisk, fresh, buoyant temperature; and this may necessitate lighting the boiler fire sometimes even in summer when the weather is chilly and "muggy." Plain loamy soil, with nothing beyond a slight admixture of potash (1 lb. of sulphate of potash per barrow-load), suits Tomatoes. If grown in pots, let 10-in. be the largest size, and when the plants are shifted to them from smaller pots do not fill up at once; wait until they are rooting freely, then give a top dressing. Tomatoes are generally propagated by seed, but cuttings are occasionally used in autumn by those who want winter Tomatoes. The seed is sown in winter or spring, according to the season when the crop is required. For very early crops the seed should be sown in January or February, for summer crops in March. The first sowings may be made in a propagating pit, heated frame, or warm house, the latter in a cool house. The plants should be pricked off a few inches apart when they begin to crowd each other, and potted separately when they touch each other again. Care should be taken not to over-water in spring. Each plant will need a strong stake. As fast as the side shoots show in the axils of the leaves they should be nipped out, so that the plants are kept to one stem. Flower clusters will appear in short shoots on the main stem. When 3 bunches of fruit are formed the following mixture of chemical manure may be prepared, sprinkled over the soil, and watered in twice a week: 1½ part superphosphate, 1 part sulphate of ammonia, ½ part sulphate of potash, ¼ part Veltha. Plants for outdoor cultivation may be raised similarly to the others, and either put into 5-in. pots in April or into fairly deep boxes. They may be planted out about the beginning of June, a little earlier or later according to the district. They may be set 18 ins. apart against a south or west wall, or supported with strong stakes in the open. In either case it will probably be found convenient to stop them at about 4 ft. high. The side shoots may be suppressed as in the case of pot plants. If sprayed with Woburn Bordeaux Paste in solution towards the end of June, and again at the middle of July if the weather is damp, disease can be kept at bay. Rich soil should be avoided, and a light dressing of superphosphate and sulphate of potash, 2 oz. of the former to 1 of the latter per square yard, will be better than much farmyard manure. The soil should be made firm round the plants. Reduce the foliage to hasten ripening. Black spot is best kept under with fresh liver of sulphur, ½ oz. per gallon of water.

The varieties of Tomatoes are numerous, but the following will be found reliable: Ideal, Lister's Prolific, Open-Air, Sunrise. For exhibition purposes Perfection may be chosen, but it should be grown under glass.

Turnip (Brassica Rapa).—A useful vegetable, well adapted for culture as a "catch crop" between Peas, but also suitable for being sown broadcast in beds. Coming into use in 6 or 8 weeks from sowing, Turnips are handy for coming between two long-season crops. They may, for instance, be sown in late summer on ground

from which a crop has been cleared, and give produce the same autumn. The soil need not be heavily manured, but it should be raked fine and the seed sown half an inch deep. Outdoor sowings may begin in sheltered spots in February if the ground is dry enough, and continue until September. The crops may fail in hot, dry weather, especially if they are attacked by the flea beetle (Haltica nemorum), which riddles the leaves. A good remedy is to roll or tread the bed as soon as the young plants come through, and this may be supplemented by dusting early in the morning with soot or wood ashes. It is advisable to choose varieties according to the soil and season of sowing. Thus one of the best for early sowings is Early Milan, and this should be followed by Snowball or



PART OF A GALL FROM A TURNIP OR GREEN, WITH GRUB INSIDE.



THE TURNIP GALL-WEEVIL.

Model, which may be sown again in August, but should not be sown in summer except in cool, moist districts. Two of the best hot-weather varieties are Red Globe and Green Round. A suitable sort for sowing in autumn is Chirk Castle, as it is very hardy. Gall-weevil sometimes attacks Turnips. *See* remarks on gas-lime under Broccoli.

Vegetable Marrow (Cucurbita ovifera).—The majority of people enjoy Vegetable Marrows as a variant on Peas and Beans in summer, and there is rarely much difficulty in getting a good supply, as the plant is easily grown. The one serious trouble is the falling of the fruit in the first stage, and that is due to faulty pollination. It can be remedied by placing the non-fruit-bearing flowers in contact with the fruit-bearers when the pollen is ripe. Where an early crop is wanted seed should be sown in February in a warm house or heated frame, and the plants subsequently hardened in a cold frame. They may be planted out early in May if the locality is a mild one and the place sheltered; but mid-May is early enough in exposed places, and even then something should be kept at hand for putting over them on cold nights. With bush Marrows 6 ft. apart will not be too close; but if running varieties are used the plants had better be given 12 ft. Speaking generally, the bush Marrows crop earlier than the runners, but are not such heavy croppers. Some growers make small pits, which they fill up with garden offal and manure, planting the Marrows on the top. The plan is not to be recommended, as in wet seasons there is great trouble from fruit-dropping. A barrowful of soil placed in a heap of manure will generally insure vigorous growth and a heavy crop. With well-done ground in a good kitchen garden Vegetable Marrows require nothing beyond plain soil. The plants may be put between early Peas, and can be allowed to spread over the ground when the

Peas are cleared. The following are good varieties: Long White (running), Pen-y-Byd (running), Tender and True (bush).

Kniphofia, Flame Flower, Red-hot Poker, Torch Lily (kniphō-fia, after Professor Kniphof. Ord. Liliaceae).—One of our noblest hardy herbaceous plants, splendid for making bold groups. The leaves are long and arching, and the flowers are borne in the form of a cone on a long, stiff stem. The prevailing colours are yellow, orange, and red. They form thickened rootstocks, and need careful division in spring if propagation is required. Plants may be raised from seed in spring. In rich, loamy soil magnificent plants are produced, but they will thrive on well-drained clay, and even on chalk if well watered in dry spells until established. Special sites should be chosen for them, in order to get fine colour effects. The leaves may be tied over the crowns in autumn to throw off rain. The following are the principal sorts: aloides (syn. uvaria), the common Flame Flower (*see* the *Botanical Magazine*, t. 758); there are several good named varieties or hybrids, such as Franz Buchner, nobilis, Obelisque, Pfitzeri, Saundersii, and Star of Baden-Baden. Corallina and its variety superba are dwarf growers. Leichtlini has red and yellow flowers (see *Bot. Mag.*, t. 6716). Longicollis (syn. primulina) is a greenhouse species with pale yellow flowers. Macowani is a dwarf species with coral flowers. Rooperi, orange and yellow, and Tuckii, red and yellow, are good. Kniphofia is synonymous with Tritoma.

Kochia (kō-chia, after Herr Koch. Ord. Chenopodiaceae).—K. tricopilia (scoparia) is an uncommon hardy annual, forming a symmetrical bush of soft green fern-like foliage in summer, which turns red in autumn. This is used in flower-beds and borders. It is not particular as to soil, but does not care for dry chalk. Grow as a half-hardy annual. *See* Annuals.

Kohl-rabi.—Generally regarded as a farm crop, the Kohl-rabi is well worth growing in gardens, and needs the same treatment as Cabbages (*see* Kitchen Garden). Earliest Purple and Earliest White are good varieties.

Labels.—These are a necessary evil in gardens, and should be as inconspicuous as possible. Plain wooden labels, the upper part touched with white paint to take the impress of the pencil, are cheap and handy. They do not last long unless the lower part is soaked in creosote, Stockholm tar, or some other preservative. Zinc labels, with indelible ink, are suitable for many purposes. For large permanent labels metal tallies with the name stamped in bold raised letters should be used. Celluloid labels are good and cheap. Labels wired on to young trees should be examined to see that the shoot is not growing round the wire.

Laburnum (labūr-num, the Latin name. Ord. Leguminosae).—Useful deciduous trees, generally grown as standards, and bearing abundance of long, drooping racemes of yellow flowers in spring. The Scotch, alpinum, is liked better than the common. The Laburnums thrive in almost any kind of soil, from chalk to clay, and do not object to banks. They will do in towns. They should be

planted in autumn or late winter, and staked securely. Propagation is by seeds, which are poisonous; but budding and grafting are practised in the nurseries. The genus was once included with Cytisus, the common Laburnum being known as Cytisus Laburnum. It is now Laburnum vulgare. There are several varieties, such as the yellow-leaved, aureum; and the Oak-leaved, quercifolium. There are several varieties of the Scotch, Watereri being good. One of the most interesting of the Laburnums is Adami (syn. Cytisus Adami), with purple flowers, which resulted from grafting Cytisus purpureus on the common Laburnum; several shoots grew from the graft, and the most vigorous one, propagated separately, gave all the plants now known as C. Adami. Some specimens give a peculiar example of reversion, for one bud on a tree will give the yellow Laburnum, while others on the same tree revert to the purple parent. Both species are fertile, but the hybrid itself is sterile. In other trees the hybrid remains fixed.

Lachenalia (lachenā-lia, after M. de la Chenal. Ord. Liliaceae).—*See* Bulbs.

Lackey Moth Caterpillar.—*See* Fruit—Apples.

Lactuca, Lettuce (lactū-ca, from *lac,* milk, in allusion to the juice. Ord. Compositae).—*See* Kitchen Garden.

Lady Fern, Asplenium filix-foemina.

Lady's Smock, Cardamine pratensis.

Laelia (lāē-lia, after the vestal virgin Laelia. Ord. Orchidaceae).—Beautiful hothouse epiphytal Orchids, resembling Cattleyas, with which they have been crossed. The cultural remarks made under Cattleya apply to them. The following are the principal sorts: anceps, winter bloomer, and its varieties, such as alba, Ashworthiana, and Percivalina, different colours (*see* the *Botanical Register,* t. 1751). Autumnalis, winter, various colours, sweet (*Botanical Magazine,* t. 3817); alba and atro-rubens are good varieties. Cinnabarina, cinnabar, spring. Perrinii, winter, red and white. Pumila, autumn, various colours. Purpurata, late spring, purple, etc.; several varieties, such as alba, atropurpurea, and Schroderae. Tenebrosa, late spring, brown and purple; the Tring Park and Walton Grange varieties are good. There are many hybrids between the above species, also bigeneric hybrids between Laelias and Cattleyas; and trigeneric hybrids between Laelias, Cattleyas, and Brassias. For these a modern work on Orchids should be consulted, as they are counted by scores, and the descriptions are highly technical.

Laelio-Cattleya.—*See* above.

Lagurus ovatus, Hare's-tail Grass (lagū-rus, from *lagos,* a hair, and *oura,* a tail. Ord. Gramineae).—For culture, *see* Annuals—Grasses.

Lamb's Lettuce.—*See* Kitchen Garden—Corn Salad.

Lamium, Dead Nettle (lā-mium, Pliny's name. Ord. Labiateae).—L. maculatum is the only species grown to any extent. It thrives in ordinary soil, and is propagated by division in spring, or cuttings. Aureum is a yellow-leaved variety.

Lantana (lantā-na, the old name for Viburnum. Viburnum Lantana is the Wayfaring Tree of the hedgerows. Ord. Verbeniaceae).—Pretty dwarf shrubs, suitable for the greenhouse and for bedding in summer. The foliage resembles that of Heliotrope, and the flowers are in Verbena-like heads. They thrive in ordinary soil, and are propagated by cuttings of young wood under glass in summer. The species are not much grown, the majority of people preferring garden varieties, such as Drap d'Or, yellow; La Neige, white; and Magenta King, purplish-red. Salvifolia, which has mauve flowers and a purple-tinted leaf, is a good plant for summer bedding, and may also be used for winter blooming in a warm greenhouse (syn. violacea).

Lapageria (lapagē-ria, after Josephine de la Pagerie, afterwards Josephine Beauharnais and wife of Napoleon Buonaparte. Ord. Liliaceae).—Lapageria rosea is one of the most beautiful of all indoor climbers, as in addition to marked vigour of growth it has the advantage of producing large quantities of drooping tubular flowers of a bright rose colour in early summer. The white variety, albiflora or alba, is also beautiful. The Lapagerias are suitable for rambling on the roof of a large cool glass house, and if planted out in well-drained peat, and kept safe from frost, they will thrive. They are not at home in pots. Propagation is by layers. Prune by cutting out old flowered shoots and any weak growths. The house should be vaporised frequently to keep the plants free from insects. Nash Court is a fine variety. Rosea is illustrated in the *Botanical Magazine*, t. 4447; and albiflora in t. 4892.

Larch (Larix europaea. Ord. Coniferae).—One of the most extensively planted of hardy deciduous Conifers. It is at its best when the new leaves break in spring. No particular compost is needed. Propagation is by seeds; the seedlings must be transplanted early, or the roots will not be fibrous. Larch poles are good for making arches, pillars, and pergolas (*see* Flower Garden). There are several varieties of the common Larch, such as glauca, pendula, and sibirica. Larix pendula is the Black Larch.

Larkspur.—*See* Delphinium and Annuals.

Larva.—A caterpillar, grub, or maggot.

Lastraea.—This genus of ferns is now allied to Nephrodium by botanists, with the exception of aristata, which is called Aspidium aristatum. Filix-mas is the famous Male Fern, of which there are many varieties. It is a hardy species, as also is dilatata. *See* Ferns.

Latania, Bourbon Palm (latā-nia, from Latanier, the family name of the Bourbons. Ord. Palmae).—One of our handsomest room and conservatory palms is Latania borbonica, which has broad fronds. Botanists now call it Livistona chinensis. For culture, *see* Palms.

Laterals.—A term applied to the side shoots of Vines, but equally applicable to the side shoots of other plants.

Lathyrus (lāth-yrus, from *la*, addition, and *thouros*, irritant, in reference to the seeds causing excitement. Ord. Leguminosae).—

The principal members of this genus are the Sweet Pea, L. odoratus (*see* Sweet Peas), and the Everlasting Pea, C. latifolius or sylvestris platyphyllus (*see* Everlasting Pea). L. sativus is the dwarf annual Chickling Vetch, the blue form of which is often erroneously called Lord Anson's Pea. L. magellanicus (syn. nervosus) is the true Lord Anson's Pea, and is a deciduous perennial, like the Everlasting Pea. Tingitanus, an annual with purple flowers (*Botanical Register*, t. 1383); Drummondii, a red perennial; grandiflorus, a rose perennial (*Botanical Magazine*, t. 1938); and rotundifolius, a rose perennial (*Bot. Mag.*, t. 6522), are sometimes grown. They are all hardy, and increased by seeds or root division in spring. Any good soil suits.

Lattice-leaf Plant, Ouvirandra fenestralis.

Laurel.—This popular evergreen is the Prunus laurocerasus of botanists. A rapid grower, and succeeding on almost any soil, it is very useful for forming screens and shelters quickly. Young plants should be planted between November and April, and they may be put 6 to 9 ft. apart according to the fertility of the soil; the richer it is the more room they should have. For pruning, *see* Evergreens. When old plants are shifted they sometimes lose their leaves, but they usually break again from the old wood and are soon green. The Portugal Laurel, P. lusitanicus, has narrow leaves. The Laurels may be propagated by cuttings and layers if desired, but they are so cheap that it is hardly worth while to raise stock at home. The Cherry Laurel is also P. laurocerasus. The Sheep Laurel is Kalmia angustifolia. The Aucuba is sometimes called the Variegated Laurel.

Laurestinus or **Laurustinus.**—This useful evergreen is the Viburnum Tinus of the botanists. Of compact habit, not growing quickly to an unwieldy size, with handsome leaves and pretty flowers, cheap, easily transplanted between November and April inclusive, and thriving in most soils, it is a very useful shrub, and should always be chosen where inexpensive evergreens are wanted.

Laurus nobilis, Sweet Bay (lāū-rus, from *laur* (Celtic), green. Ord. Laurineae).—This handsome tree is well worth growing, and it thrives in fertile, loamy soil. Propagation is by cuttings in a greenhouse in September, or by seeds sown when ripe. The leaves are aromatic, and the flowers, which are yellow and borne in spring, are followed by purple berries. Angustifolia is a narrow-leaved variety. In cold districts plant in a sheltered place.

Lavatera, Rose Mallow (lavatē-ra, after Lavater. Ord. Malvaceae).—The most valuable of the Rose Mallows are the hardy annual rosea-splendens and its white variety; the former makes a large bush in summer from spring-sown seed, and bears a profusion of beautiful pink flowers, which last well. Arborea variegata, the variegated Tree Mallow, is a handsome biennial.

Lavender, Lavandula (lavăn-dula, from *lavo*, to wash. Ord. Labiatae).—The common Lavender, L. vera, is a popular shrub, with its greyish leaves and perfumed flowers. It will thrive on most soils and has a partiality for chalk. Propagation is by cut-

tings of side shoots in late summer in a cold frame. Plant in autumn or spring. The flowers are generally ready for use about the end of June, when they can be dried or distilled.

Lavender Cotton, Santolina.

Law.—The following are a few points of law as affecting horticulturists: (1) A gardener is a domestic servant. He is entitled to a month's notice, but may be summarily dismissed for wilful misconduct. (2) Trees and shrubs planted by a tenant hiring freehold property may not be removed without the consent of the owner, which should be obtained on taking up the tenancy. Such consent is not necessary in trade establishments. (3) Greenhouses nailed to walls and attached to mortared bricks may not be taken away without consent, unless used for trade purposes; if, however, erected in sections on loose bricks, and attached by screws, they may be removed. (4) Trees hanging over from a neighbour's ground may be cut if the owner refuses to deal with them. Fallen fruit may not, however, be appropriated; the owner has right of access to pick it up if it is not delivered voluntarily. (5) Poultry and animals trespassing on another property may not be killed, but the owner is liable for any damage which they may do.

Lawns.—No garden looks perfect without well-kept grass, and flower lovers must not allow their passion for plants to cause neglect of the turf. It is common nowadays to plant bulbs in grass, and very charming the flowers are in spring (*see* Bulbs). This accustoms the eye to seeing a certain amount of rough grass; but it is no reason why the tennis lawn, the broad grass paths round herbaceous borders, the narrower strips along drives, and pieces of turf near the house should be neglected. On the contrary, they should be mown and rolled from the time that the grass begins to grow in spring. For details, *see* Flower Garden—Grass.

Layering.—A method of propagation practised with Quince and Paradise stocks for fruit trees, with many trees and shrubs, and with Carnations. Shrubby plants with low, spreading branches lend themselves to layering. The process consists in drawing a portion of the branch down to the ground, pegging it, and heaping on soil. It is generally done late in summer. In the case of Carnations a slit is made in the stem, but this is not so with most shrubs, which root from the bark. They are best left a year before being severed. Carnations are ready in a few weeks. A layer has no tap root, and this is an advantage with trees and shrubs.

Leaf Mould.—A valuable ingredient of potting compost, formed of rotten leaves. As a rule, from a third to a fourth is a suitable proportion, the bulk of the compost being loam. A larger proportion may be used for propagation, as leaf mould, with sand, encourages root production. The effect of leaf mould is to lighten soil, and it is a good addition to stiff land.

Leatherjacket.—The grub of the Crane fly, Tipula oleracea. It may be reduced by dressing the ground with Vaporite or Apterite in spring. Baits of Potato or Mangold should be put near valuable plants, such as choice Carnations.

Leek.—*See* Kitchen Garden.

Legumes or **Leguminous Crops.**—Pod-bearers. *See* Peas, etc., under Kitchen Garden.

Lent Lily.—*See* Bulbs—Daffodils.

Leontopodium.—*See* Edelweiss and Flower Garden—Rockery.

Leopard's Bane.—*See* Doronicum and Flower Garden.

Leptosiphon (leptosī-phon, from *leptos*, slender, and *siphon*, tube. Ord. Polemoniaceae).—Charming hardy annuals. Densiflorus and its white variety are particularly good. For culture, *see* Annuals. Modern botanists refer the genus to Gilia, but it is kept separate in gardens.

Lettuce.—*See* Kitchen Garden.

Leucojum, Snowflake (leucō-jum, from *leukos*, white, and *ion*, violet—literally, the white Violet, in reference to the purity and perfume. Ord. Amaryllideae).—*See* Bulbs.

Lewisia (lewīs-ia, after Captain Lewis. Ord. Portulaceae).—Hardy plants, suitable for the rockery, and thriving in dry, sunny spots if given a compost of loam, leaf mould, and sand. They are propagated by division or seeds in spring. L. rediviva is a very interesting plant, growing about 4 ins. high, and with rose flowers in summer. Tweedyi has pink flowers in August.

Leycesteria (leycestēr-ia, after Mr. W. Leysser. Ord. Caprifoliaceae).—Hardy shrubs. Formosa is the only species grown. It produces its purple and white flowers in summer, is not particular as to soil, and may be propagated by cuttings of ripe wood in autumn or young wood in spring, under a bell-glass (*see* the *Botanical Magazine*, t. 3699). There is a variegated form.

Liatris, Blazing Star (liā-tris. Ord. Compositae).—Hardy herbaceous plants, thriving in light soil, and propagated by division in spring, or by seeds in a greenhouse or frame. Pycnostachya is the most popular species; it grows about 4 ft. high, and bears purple flowers on long spikes in late summer. Spicata, purple, is also grown.

Libertia (libēr-tia, after Madame Libert. Ord. Iridae).—Useful plants for the border or rockery, flowering late in spring. They like light, friable soil, and a covering of litter or ashes in winter. Propagation is by division or seeds in spring. Formosa, 1½ ft.; grandiflora, 3 ft.; and ixioides, 3 ft., all with white flowers in late spring or early summer, are good. Paniculata, 1½ ft., also with white flowers, is pretty, but more tender (*see* the *Botanical Magazine*, t. 6263).

Libocedrus (libocē-drus, from *libanos*, incense, and *cedrus*, cedar—literally, the incense-scented Cedar. Ord. Coniferae).—A small genus of evergreen conifers, the most popular species of which is decurrens, a tall, slender, and beautiful tree. It likes a well-drained, loamy soil. Propagation is by seeds, sown when ripe in a greenhouse or frame; and by cuttings in summer. Aureo-variegata, yellow leaves; and compacta glauca are varieties.

Libonia (libō-nia, after M. Libon. Ord. Acanthaceæ).—A useful hothouse genus, flowering in winter. They thrive in loam with a third of leaf mould and some sand. Propagation is by cuttings beneath a bell-glass in spring. Floribunda, 2 ft. high, yellow, is the popular species.

Lichens.—When present, with mosses, on fruit trees the lichens are out of place. They are less common on trees growing in well-drained soil than on those in damp ground. Old orchard trees are often badly infested. The bark can be cleaned by spraying the trees in winter with 1 lb. of caustic soda and 1 lb. commercial potash, each mixed separately in tubs containing 5 gallons of water, then mixing. Gloves should be worn.

Ligustrum, Privet (ligūs-trum, from *ligulare,* to tie, the shoots being sometimes used for tying. Ord. Oleaceæ).—The popular evergreen hedge plant is Ligustrum ovalifolium (*see* Hedges). The genus is a large one, but of little importance save for the Privet.

Lilac, Syringa (syrīn-ga, from the Persian *Syrinx.* Ord. Oleaceæ).—The common Lilac is one of the best of small flowering trees, and every lover of this fragrant old favourite should try to add a few selected varieties to his shrubbery. There are several which have finer flowers than the common Lilac, while retaining its fragrance. Of such are—

Charles X., lilac	Rubra de Marly, red
Madame Lemoine, double white	Souvenir de Louis Späth, deep lilac
Marie Legraye, white	

These may be planted in autumn or spring, preferably in deep, loamy soil, but they are not fastidious so long as the soil is not downright poor. Lilacs are also grown in pots for forcing into early bloom, and for this purpose the variety Charles X. is much used. Small plants may be potted up into 7-in. or 8-in. in autumn, in a compost of loam and leaf mould. Propagation is by cuttings and grafting. Persica is the Persian and vulgaris the common Lilac.

Lilium, Lily (līl-ium, from *li* (Celtic), white. Ord. Liliaceæ).—*See* Bulbs.

Lily of the Valley.—*See* Bulbs and Convallaria.

Lime.—Very useful in gardens, although a shallow limestone soil is by no means the best which might be chosen for gardening. Limestone and chalk are carbonates of lime; when they are subjected to great heat in a kiln a great deal of carbonic acid is driven off, and we get what is called quicklime. If this is placed in water it crumbles to a powder, giving off heat. In such a state it is easy of application. It may be applied at the rate of 28 lb. per square rod to land that has been heavily manured for several years, and will do good by neutralising the humic acid which has accumulated, and which checks decomposition and nitrification. It should not be applied to ground devoid of humus. Milk of lime is used in conjunction with copper sulphate as a fungicide (*see* Bordeaux Mixture). Fresh powdered quicklime may be dusted over the ground at night to kill slugs. Gas-lime may be used at the rate of 14 lb.

per square rod if land is badly infested with club-root and gall-weevil, provided it is allowed to lie on the surface for 6 weeks before being turned in. To make lime-water, which is also good for reducing slugs, put 3 lb. of lime in a gallon of water and let it stand a few hours, then strain off the clear liquid and use.

Lime Tree or **Linden.**—This is the Tilia (tīl-ia, Ord. Tiliaceae) of Virgil. It is a handsome tree, with yellowish, highly scented flowers in spring, which attract the bees. It does well in towns, and the avenues in Berlin are famous. A deep, well-drained, loamy soil is best. The White or Silver Lime, the under side of the leaf of which is silvery, is T. argentea; orbicularis is a variety. Vulgaris is the common Lime, and it has a variegated form. Other good species are Americana, the American Bass Wood, petiolaris, and platyphyllos; there are many varieties of the latter.

Limnanthes (limnān-thes, from *limne*, marsh, and *anthos*, flower, in allusion to their love of moist places, but they will thrive in the sun. Ord. Geraniaceae).—Pretty dwarf hardy annuals, with yellow and white flowers, beloved of bees. Douglasi is the most popular species. For culture, *see* Annuals.

Linaria, Toadflax (linā-ria, from *linon*, flax, in allusion to the form of the leaf. Ord. Scrophularineae).—Pretty dwarf hardy plants, some annual, others perennial. The former are raised from seed in spring (*see* Annuals), the latter from seed and by division. They are not particular as to soil. Alpina, which grows about 6 ins. high, and has charming violet and yellow flowers in summer, is excellent for the rockery. Cymbalaria, the Kenilworth Ivy or Pennywort, is a pretty lilac trailer for walls and banks; there is a white variety, alba; and a variegated, variegata. Reticulata, 2 ft. high, with purple and yellow flowers, is a hardy annual; and bipartita splendida is a good purple annual. There are numerous other species of less importance.

Ling.—*See* Calluna.

Linnaea borealis (linnāē-a, after Linnaeus. Ord. Caprifoliaceae).—A hardy trailing evergreen, often planted in peaty soil in the rock garden. It likes a shady position, and may be propagated by division in spring. The pale pink flowers are sweet.

Linum, Flaz (lī-num, from *linon*, flax. Ord. Lineae).—Hardy annuals and perennials, some being very desirable plants, notably the hardy scarlet annual, grandiflorum rubrum (coccineum); and the perennials, flavum, yellow, 15 ins. high; narbonense, blue, 2 ft.; and perenne, blue, 1 ft. Alpinum is a charming rockery plant growing about 4 ins. high, with blue flowers in summer. All these are hardy herbaceous plants, propagated by division in spring, or cuttings of the young shoots in spring; grandiflorum rubrum by seeds. They are not particular as to soil, so long as it is not stiff and damp.

Lippia, Lemon-scented Verbena (līp-pia, after M. Lippi. Ord. Verbenaceae).—Only one species is grown to any extent, and that is citriodora, the foliage of which is strongly and agreeably scented. It is a white-flowered greenhouse shrub, liking loam with a little

leaf mould and a good deal of sand. Propagation is by cuttings in a warm house or frame in spring. *See* the *Botanical Magazine*, t. 367, as Aloysia citriodora, which is one of the synonyms; Verbena triphylla is another.

Liquid Manure.—*See* Manure.

Liriodendron tulipifera, Tulip Tree (liriodēn-dron, from *lirion*, Lily, and *dendron*, tree. Ord. Magnoliaceae).—A handsome, hardy, spreading tree, which produces abundance of large, Tulip-like, green and yellow flowers in summer when some years old. It is a fine tree for a large lawn or extensive pleasure grounds. A loamy soil, lightened with peat, suits it best. Propagation is by seeds in spring.

Lithospermum, Gromwell (lithospēr-mum, from *lithos*, a stone, and *sperma*, seed. Ord. Boragineae).—The species prostratum is a good dwarf creeping shrub, suitable for the rock garden, and yielding a profusion of bright blue flowers. It is not particular as to soil, and will thrive on limestone. Propagation is by seeds, cuttings, and division in spring. Graminifolium, blue flowers in spring, is a good Alpine. Heavenly Blue is very pretty.

Livistona (livistō-na, after Mr. Murray of Liviston. Ord. Palmae).—Handsome fan-leaved palms, the most popular species of which is australis. It likes a warm greenhouse, but with care may be grown in a room. Chinensis is the palm often grown under the name of Latania borbonica. For culture, *see* Palms.

Loam.—The frequent mention of this as the principal ingredient in composts would lead to the supposition that it is important to plants. Such is indeed the case. The "fibrous loam" of the gardener is the result of the decay of turves. The better the pasture the better the loam. The turf should be stacked grass side downwards and left for a year, when it should be chopped up and used. The layer of soil immediately beneath the turf of a good meadow is also good for potting loam, if yellow or light brown, but the grey soil from limestone or the dark soil from clay is not good enough. Loam is the best body soil for a garden, as when tilled and manured it suits nearly all plants. *See also* Soil.

Lobelia (lobē-lia, after M. Lobel. Ord. Campanulaceae).—A most useful genus, giving, as it does, dwarf bedding and tall herbaceous plants. L. erinus is the little, dense, tender, blue-flowered plant so much used for margins, and it may be grown as a half-hardy annual, being raised from seed in a warm house or frame in winter. Afterwards it may be perpetuated by cuttings, taken in winter from "stock" plants lifted in autumn, potted, and wintered on the shelf of a warm house. Barnard's Perpetual and Emperor William are good single blue forms; and White Gem and White Lady good whites. Prima Donna is reddish. Ramosa and its varieties, blue, white, and rose, are taller, and are often grown in pots. L. cardinalis is a hardy herbaceous perennial, growing about 3 ft. high, with scarlet flowers in summer. Fulgens is also a fine scarlet perennial, blooming somewhat earlier; there are many varieties of it, differing in colour. Queen Victoria, scarlet; Lord Ardi-

laun, crimson; and Heavenly Blue, blue, are good. Syphilitica, blue, is a fine, tall, summer-flowering species, and is a hardy perennial. The perennials like rich, friable soil, and are propagated by cuttings in spring; it is best to winter cardinalis and fulgens in frames. They make beautiful beds and border groups if planted 2 ft. apart in May and well watered. *See* the *Botanical Magazine* for coloured plates of cardinalis, t. 320; and erinus, t. 391. Fulgens is illustrated in the *Botanical Register*, t. 165.

Loganberry.—*See* Fruit.

Lomaria (lomā-ria, from *loma*, an edge, in allusion to the position of the spores. Ord. Filices).—A large genus of ferns, resembling Blechnums, some hardy, notably Spicant, the British Hard Fern, which has broad, green, hard, leathery fronds; cristata, multifurcata and ramo-cristata are a few of the many varieties. They are propagated by division. Gibba requires a warm greenhouse; Bellii is a pretty variety of it. Ciliata, which resembles gibba, is a good room fern; grandis is a good variety of it. These should be grown in loam and peat, equal parts, with sand. Propagation is by spores (*see* Ferns) and offsets.

London Pride (Saxifraga umbrosa).—A pretty edging plant, hardy, perennial, throwing up sprays of rosy flowers in summer. It is not particular as to soil, and may be increased by division in spring.

Lonicera, Honeysuckle (lonīc-era, after Herr Lonicer. Ord. Caprifoliaceae).—*See* Honeysuckle and Climbers.

Lophospermum.—*See* Maurandia.

Lord Anson's Pea, Lathyrus magellanicus (nervosus).

Love Grass (Eragrostis).—*See* Annuals.

Love-in-a-mist (Nigella).—A pretty hardy annual (*see* Annuals). The largest variety is Miss Jekyll, which has fine blue flowers, and is one of the best late-blooming annuals, especially on limestone.

Love-in-idleness.—*See* Pansy.

Love-lies-bleeding, Amaranthus caudatus.

Luculia gratissima (lucū-lia, from *luculi swa*, a native name. Ord. Rubiaceae).—This fragrant greenhouse shrub bears pale pink flowers in autumn, and is good for planting out in a large house. It thrives in equal parts of peat and loam, with sand. Propagation is by cuttings in heat in early summer. Prune back to the old wood in winter (*see* the *Botanical Magazine*, t. 3946).

Lunaria.—*See* Honesty.

Lungwort.—*See* Pulmonaria.

Lupinus, Lupin (lupī-nus, from *lupus*, wolf; a fanciful name, indicating its destructive power in overrunning land. Ord. Leguminosae). — Popular plants, including both hardy annuals and perennials. For the culture of the former, *see* Annuals; of the latter, Flower Garden. The shrubby species should be propagated by cuttings; almost any soil suits them. The following are the best of the Lupins: arboreus, the tree Lupin, a hardy evergreen with purple and yellow flowers, in summer growing 5 to 6 ft. high (*see* the

Botanical Magazine, t. 682). Snow Queen is a good white variety. Hartwegi, blue and white, 2 ft., is a hardy annual (*Botanical Register*, t. 31). Hybridus atrococcineus is a splendid annual, scarlet with white tips. Mutabilis is a half-hardy sub-shrubby perennial, 4 to 5 ft. high, with blue and white flowers. Nanus, blue and white, 1 ft., is a hardy annual (see *Bot. Reg.*, t. 1705). Polyphyllus is a fine blue hardy herbaceous perennial, 3 to 4 ft. high (*Bot. Reg.*, t. 1096); alba is a white variety, Purple King a purple, and Somerset a yellow. Subcarnosus, blue and white, 1 ft. (*Bot. Mag.*, t. 3467), is a perennial. The annuals may be raised from seed in spring, the herbaceous perennials from seed and by division. They are not particular as to soil.

Lycaste (lycās-te, after Lycaste, daughter of Priam. Ord. Orchidaceae).—A small genus of Orchids, requiring a warm house, with abundance of water in the growing season, and little during the period of rest. They thrive in fibrous peat. Propagation is by division after flowering; 50° to 60° will be a suitable winter temperature, 70° to 80° in summer. Skinneri, with red and white flowers in winter, 15 ins. high, is the most popular species; there are many varieties of it, as well as some hybrids, such as Balliae, hybrida, and Mary Gratrix. Costata, cream, and gigantea, purple and orange, are also grown.

Lychnis, Rose Campion (lȳch-nis, from *lychnos*, a lamp, in allusion to the bright colour. Ord. Caryophylleae).—Beautiful hardy plants, comprising both annuals and perennials. The most popular of the latter is chalcedonica, which grows 2 to 3 ft. high, and bears light scarlet flowers at the top of the stems. The latter are easily broken from the rootstock, and the plant should therefore be handled carefully. It may be propagated by seed or division in spring. It is not fastidious about soil. There are white and double varieties. L. coeli-rosa, the Viscaria oculata of gardens, is a pretty hardy annual with rose and white flowers. Coronaria (syn. Agrostemma coronaria) is a perennial 3 ft. high, with red flowers and silvery foliage; there are white and double varieties. Flos-cuculi, red, 1 ft. high, early summer, is the British Cuckoo Flower or Ragged Robin, a pretty wilding. Fulgens, vermilion, 1 ft., early summer, and its variety Haageana, scarlet, are perennials; as is Viscaria, the German Catchfly, whose double rose variety, splendens plena, is a beautiful late spring perennial with rose flowers. Vespertina (syn. alba) is the perennial white Campion. Most of the Lychnises thrive in ordinary garden soil, and are easily raised from seed in spring.

Lycopersicum esculentum (Tomato).—*See* Kitchen Garden.

Lycopodium, Club Moss (lycopō-dium, from *lykos*, wolf, and *pous*, foot, referring to the form of the roots. Ord. Lycopodiaceae).—The Lycopodiums form dense masses of verdure. L. clavatum is the British Club Moss, and selago the Fir Club Moss. Peat, with a quarter each of Sphagnum moss and sand, suits. Tips of the growing shoots soon make plants if put in a warm, shady place. The plants are best grown in wooden baskets. They must have shade and abundance of water in summer, but little water in winter.

Lygodium, Climbing Fern (lygō-dium, from *lygodes*, flexible, on account of the twining habit. Ord. Filices).—L. Japonicum (syn.

scandens of gardens), the Climbing Fern, is suitable for growing up the pillars and walls of warm greenhouses and conservatories, especially if it can be planted out. Peat, loam, and leaf mould in equal parts, with sand, make a suitable compost. Propagation is by spores (*see* Ferns) or division in spring or summer. They will enjoy syringing on hot days. Palmatum is a good greenhouse species. Dichotomum needs a stove.

Lysimachia, Loosestrife (lysimā-chia, from *lysis*, ending, and *mache*, strife, in reference to the reputed tranquillising influences. Ord. Primulaceae).—Clethroides, white flowers in late summer, 3 ft., is one of the best. Nummularia is the popular "creeping Jenny" which cottage folk love to grow in suspended pots. It thrives in any soil, and is easily propagated by division; the variety aurea has golden leaves. Vulgaris, 2 to 3 ft., yellow, is the common Loosestrife.

Lythrum (lȳ-thrum, from *lythron*, black blood, in reference to the dark colour. Ord. Lythrarieae).—Salicaria is the purple Loosestrife, a hardy perennial 4 to 6 ft. high that luxuriates at the waterside. Rosea and superba are varieties of it. Propagation is by division in spring.

Macartney Rose, Rosa bracteata.

Macrotomia (macrotō-mia. Ord. Boragineae).—A small genus, the most prominent member of which is echioides, the Prophet Flower, also called Arnebia echioides. It grows about a foot high, and has yellow flowers spotted with brown in early summer. Benthami, purple, summer, 2 ft. (*Botanical Magazine*, t. 7003), is also grown. They thrive in a sunny part of the rockery in loamy soil, and are propagated by division in spring.

Magnolia (magnō-lia, after Professor Magnol. Ord. Magnoliaceae).—Beautiful shrubs, some deciduous, others evergreen, some hardy, others half-hardy. All like a good loamy soil. The common sorts are propagated by layers in autumn, the choicer ones by budding and grafting. Conspicua, the Yulan, has beautiful white flowers in spring; it is deciduous (*see* the *Botanical Magazine*, t. 1621). Grandiflora, large, white, is evergreen (*Bot. Mag.*, t. 1952). Lennei, rosy-purple, spring, is deciduous. Soulangeana, purple and white, spring, is deciduous (*Botanical Register*, t. 1164). Stellata, dwarf, white, blooms in advance of its leaves in spring (*Bot. Mag.*, t. 6370) (syn. Halliana), deciduous. The foregoing are the best of the species and hybrids, but there are many varieties. Grandiflora is a fine plant for a warm wall. Stellata is a suitable subject for pot culture.

Magpie Moth Caterpillar.—*See* Fruit—Gooseberries.

Mahonia aquifolia, Berberis aquifolium.

Maidenhair Fern, Adiantum cuneatum.

Maidenhair Tree, Ginkgo biloba.

Maiden Pink, Dianthus deltoides.

Maize, Zea (zē-a, from *zeo*, to live, in reference to its use as a food plant. Ord. Gramineae).—Maize, or Indian Corn, is much esteemed in the United States. It is less grown as a food crop in Great

Britain, not being so well suited by the damper climate, but several selected forms are used for flower-garden decoration. They are raised from seed sown in a warm house or frame in late winter, and the plants hardened in a cold frame. Zea Mays variegata, Japanese striped Maize, and Four-coloured Maize, are good. Those who wish to use Maize for cooking should plant 18 ins. apart in rows 5 ft. asunder and gather the cobs before they get hard.

Malcomia maritima (malcō-mia, after Mr. W. Malcolm. Ord. Cruciferae).—Only one species is important, and that is maritima, the Virginian Stock, a hardy annual. *See* Annuals.

Male Fern, Nephrodium or Lastrea Filix-mas.

Malope, Mallow (malō-pe, from *malos,* soft, in allusion to the leaves. Ord. Malvaceae).—Tall, strong hardy annuals. Trifida grandiflora has dark rose flowers; there is a white form called alba. *See* Annuals.

Malus.—*See* Pyrus.

Malva, Mallow (māl-va, from *malacho,* to soften. Ord. Malvaceae).—Hardy herbaceous annuals, biennials, and perennials, the most popular of which is moschata, the Musk Mallow, a hardy perennial with rose flowers in summer; there is a white variety. Any good soil. Propagation by seed or division in spring.

Mamillaria.—*See* Cactus.

Manetti.—*See* Rose.

Manna Ash, Fraxinus Ornus.

Manures and Manuring.—Without a proper choice and use of manures gardening cannot be carried on successfully, and a study of manures should be one of the first tasks of the learner. Virgin ground, such as is found in new countries, will produce good crops for several years without manuring; but where crops have been grown over a long period frequent manuring becomes necessary. Dealing with natural manures first of all, the following tables will be useful:—

1 ton of good decayed stable manure contains	12 lb.	potash
	8 ,,	phosphoric acid
	11 ,,	nitrogen
	16 ,,	lime
	47	
1 ton of cow manure contains	8 lb.	potash
	3 ,,	phosphoric acid
	9 ,,	nitrogen
	10 ,,	lime
	30	
1 ton of pig manure contains	4 lb.	potash
	4 ,,	phosphoric acid
	16 ,,	nitrogen
	35 ,,	lime
	59	

The plan of calculating the value of manure by the proportions which it contains of the four ingredients quoted is a good one, because they are the principal requirements of crops; at the same time, it should be pointed out that the proportions vary with the food of the animals. The excrement of cows fed on Turnips is not so rich as that of animals which are allowed cake. We see that pig manure is nominally the richest, but that much the largest proportion of its fertilising constituents is lime, and that is not so important as any of the other three. On the whole, manure from stables is the best; but cow manure is preferable on dry soil. A double use should be got from every cartload of fresh manure in a garden. The first use is to yield heat, and this the manure will do if, when taken from the stables, it is turned in and out on 3 successive days, and then trodden down into a hotbed (*see* Hotbeds, Annuals, Mushrooms (Kitchen Garden), Violets, and other crops). After it has served its purpose as a hotbed it will be thoroughly decayed and in excellent condition for manuring. When manure has to be laid up for a time the heap should be made at a spot remote from dwellings, and on a bed which will retain the ammonia-enriched liquid that drains out of the heap. A light coat of gypsum will fix the ammonia. A good quantity of manure to use is 2 barrow-loads per square rod of ground, or 30 tons per acre. In heavy soils it serves the best purpose when worked under the top spit in bastard trenching towards the end of winter (*see* Kitchen Garden). In light soils over sand or chalk it is best laid on the top after autumn bastard trenching, and dug into the top spit in spring. Human excrement is best laid up in a heap with ashes, and turned into ground which is to be cropped with coarse Green vegetables. Fowl manure is very strong, and is best mixed with a considerable bulk of earth or ashes before use. Dried blood is a good fertiliser, especially for Green vegetables and Onions. When manure decays in the soil humic acid accumulates, and it sometimes happens that after a piece of ground has been manured for several consecutive years crops do badly on it. To use the gardener's phrase, it has become "manure-sick." To speak with greater exactitude, an excess of humic acid has accumulated. The best plan in such a case is to dress the ground with broken chalk or lime.

Sterilisation.—It has been noticed that sterilising soil by burning it increases its fertility. The reason is supposed to be that the burning destroys large quantities of bacteria which prey on the nitrifying bacteria, that is, on those which are working on the nitrogenous elements in the soil, and converting them into nitrates.

Nitro-bacterine.—The existence of beneficent organisms in the soil is unquestioned, and one microbe, Pseudomonas radicicola, has the power of fixing free nitrogen from the atmosphere in the root-nodules of leguminous crops, such as Peas, Beans, and Tares. The plan has been tried of applying laboratory cultures of this microbe, under the name of nitro-bacterine, to the soil, not altogether without success in some cases, although without apparent result in others.

Artificial manures.—The fact that natural manures owe their value to the proportions which they contain of certain ingredients has led to the development of what are called artificial or chemical

manures. It was known that bones nourished crops, but that their action was slow. Various plans were tried to bring the bones into a quicker-acting state, amongst them that of treating with sulphuric acid. This proved to be successful, and the product was put on the market under the name of superphosphate of lime. Bone flour, bone meal, and mineral superphosphate are other forms of prepared bone. The following are the percentages of phosphoric acid in four different fertilisers which yield that ingredient:—

basic slag	38	
bone flour	58	
bone meal	45	(also yields ammonia)
phosphate of potash	37	(also yields potash)
superphosphate	28	

Basic slag, a by-product of the ironworks, is the most economical form of phosphoric-acid fertiliser for soils which lack lime, while superphosphate is the best for soils containing lime. Mineral superphosphate at the rate of 7 lb. per square rod is a valuable fertiliser for fruit trees and pod-bearing crops. It may be applied in February, but should not be dusted over young growing crops. Potash is also important. This is yielded by five different chemical manures as follows:—

sulphate of potash	90 per cent.		
nitrate of potash	83	,, ,,	(also contains nitrogen)
muriate of potash	80	,, ,,	
phosphate of potash	48	,, ,,	(also contains phosphoric acid)
kainit	20	,, ,,	

Nitrate of potash as also yielding nitrogen, and phosphate of potash as also yielding phosphoric acid, are particularly valuable, but their cost is very high, Kainit is good as a winter application turned well under at the rate of 14 lb. per square rod. Sulphate of potash is excellent, and may be used at the rate of 4 lb. per square rod; or 3 lb. may be used with 4 lb. of superphosphate, the two being mixed and applied about midwinter. The nitrogenous fertilisers are valuable according to the quantity of ammonia which they yield. The following is a table of kinds and quantities:—

sulphate of ammonia	24	per cent.	
nitrate of soda	18	,, ,,	
nitrate of potash	15¾	,, ,,	(also contains potash)
nitrolim	18	,, ,,	

The last is a modern fertiliser, the chemical name of which is calcium cyanamide. It contains 20 to 30 per cent. of free lime, and is a valuable manure for limeless soils. It could be used as a top dressing for weakly crops in the same way as sulphate of ammonia and nitrate of soda. It is wasteful to dig these into vacant ground in winter. Shoddy, a waste from the wool factories, yields ammonia, and is used by Hop growers. Hoof parings yield phosphoric acid. Road scrapings are good for stiff soil.

Liquid manure.—Plants coming into flower, vegetables into pod, and trees into fruit are benefited by liquid manure, whether in the

form of liquid from stables and cow-houses, broken down to the colour of weak tea with water; house slops; nitrate of soda and superphosphate at the rate of half an ounce each per gallon of water, or sheep droppings soaked in water. Soot-water is an excellent liquid, and this may be made by putting some soot into a piece of sacking and hanging it in a tub of water for a few hours. Dry soot is a safe stimulant for most crops if spread on the ground half an inch thick and hoed in.

Maple.—Handsome trees, referred to under Acer.

Maranta, Arrow-root (marān-ta, after Signor Maranti. Ord. Scitamineae).—Hothouse herbaceous perennials with handsome foliage, thriving in loam, with sand and a third of leaf mould, and propagated by division when growth starts in spring, putting the divisions in bottom heat. Chantrieri, major, Massangeana, and zebrina are popular, the latter (now Calathea zebrina) particularly so.

Marguerite.—*See* Chrysanthemum frutescens and Greenhouse.

Marigold.—*See* Annuals—Half-hardy. The African have large lemon and orange flowers, the French smaller striped flowers. There are both dwarf and tall strains.

Mariposa Lily.—*See* Bulbs—Calochortus.

Marjoram.—*See* Kitchen Garden—Herbs.

Marrow, Vegetable.—*See* Kitchen Garden.

Marsh Mallow, Althaea.

Marsh Marigold, Caltha.

Martynia (martȳn-ia, after Dr. Martyn. Ord. Pedalineae).—The most popular member of this genus is fragrans, a greenhouse annual with perfumed crimson flowers in summer, height 2 ft., sown in spring.

Marvel of Peru.—*See* Mirabilis Jalapa.

Masdevallia (masdevāll-ia, after Señor Masdevall. Ord. Orchidaceae).—Brilliant Orchids, with flat flowers, thriving in a warm greenhouse in a compost of fibrous peat and Sphagnum moss over abundance of crocks. During the growing season in summer they must have liberal supplies of water, but little will be wanted in winter when they are resting. They thrive in a cool house, and are propagated by division at midwinter, when fresh growth starts. Coccinea, red, spring, 8 ins. high; ignea, orange, spring, several varieties; Tovarensis, white, winter, 6 ins., free flowering (*Botanical Magazine*, t. 5505); and Veitchiana, vermilion, spring, 1 ft., are a few of the best species; but there is much interest in the modern hybrids, for particulars of which a good work on Orchids should be consulted.

Matricaria (matricā-ria, from *matrix*, female, owing to its use in feminine disorders. Ord. Compositae).—The most useful of these are the hardy annual varieties offered by seedsmen, such as inodora plenissima, double white; and eximia Golden Ball and Silver Ball. For culture, *see* Annuals.

Matthiola (matthiō-la, after Signor Matthioli. Ord. Cruciferae).—The only species grown under the generic name is bicornis, the Night-scented Stock (*see* Annuals), which has lilac flowers that are deliciously scented in the evening. Incana is the parent of the Brompton and i. annua of the Ten-week Stocks. *See* Annuals and Biennials.

Maurandia or **Maurandya** (maurān-dya, after Professor Maurandy. Ord. Scrophularineae).—Climbing plants for the cool greenhouse, or for the pergola or a warm wall outside in summer. Barclayana, with violet flowers in summer; and scandens (syn. Lophospermum scandens), purple flowers in summer, are the best known. The former is illustrated in the *Botanical Register*, t. 1108; and the latter, as L. scandens, in the *Botanical Magazine*, t. 3650. They may be raised from seed in heat in spring, and further increased by cuttings under a hand-light in summer. Friable loamy soil suits them.

Maxillaria (maxillā-ria, from *maxillose*, insects' jaws, in allusion to the shape. Ord. Orchidaceae).—Terrestrial Orchids with fleshy flowers, suitable for a cool house, thriving in pots in equal parts of peat and chopped Sphagnum moss, and propagated by division in spring. They are great moisture lovers, and like a shady place. Grandiflora, white and red; Lindeniae, white and pink; Sanderiana, white and red; and tenuifolia, dark red and yellow, are a few of the most popular species.

May.—*See* Crataegus.

May Bug.—*See* Cockchafers.

May Flower, Epigaea repens.

Mays.—*See* Maize.

Meadow Rue.—*See* Thalictrum.

Meadow Saffron.—*See* Colchicum.

Meadow Saxifrage, Saxifraga granulata.

Meadow Sweet, Spiraea Ulmaria.

Mealy Bug (Coccus adonidum).—One of the worst enemies of plants. It attacks hothouse, greenhouse, and vinery occupants indiscriminately. The white cottony substance seen is merely a covering, the red insect lies beneath, sucks out the sap, and renders the foliage offensive with its excrement. Regular syringing in summer, with an occasional vaporising by cone, goes far in keeping mealy bug under. Syringing with a paraffin emulsion (*see* Paraffin) is good where practicable. On emergency the leaves must be sponged. If vineries become infested they must be cleansed, together with the rods in winter.

Meconopsis (meconōp-sis, from *mekon*, poppy, and *opsis*, like. Ord. Papaveraceae).—Hardy herbaceous annuals, biennials, and perennials, the most popular of which is cambrica, the Welsh Poppy, a hardy perennial with yellow flowers in summer, 1 ft. high. Wallichii, 3 to 4 ft., blue, summer, is also a good perennial. There is a double form of cambrica called plena. Integrifolia is a splendid

modern yellow species. Punicea has brownish-red flowers. They like warm, sunny spots in the rock garden or border, and are easily raised from seed, which is best sown when ripe in the open. Friable loamy soil is best.

Medlar (Mespilus Germanica).—*See* Fruit.

Megasea.—*See* Saxifraga.

Melissa (Balm).—*See* Kitchen Garden—Herbs.

Melocactus.—*See* Cactus.

Melon.—*See* Fruit.

Mentha (Mint).—*See* Kitchen Garden—Herbs.

Menyanthes (Bog Bean).—*See* Flower Garden—Water plants.

Menziesia polifolia.—*See* Daboëcia polifolia.

Mercury.—*See* Kitchen Garden.

Mertensia (mertēn-sia, after Professor Mertens. Ord. Borragineae).—Hardy herbaceous perennials, suited for the front of the border or the rockery, thriving in almost any soil, but preferring peat, and easily propagated by division in spring. Pulmonarioides (syn. virginica), the Virginian Cowslip, blue, May, 18 ins. high (*Botanical Magazine*, t. 160), is the principal species. Sibirica, with blue and white flowers in May, is also good.

Mesembryanthemum, Fig Marigold, Ice Plant (mesembryānthemum, from *mesembria*, midday, and *anthemon*, flower, in allusion to the love of sun. Ord. Ficoideae).—A large genus of fleshy plants, producing flowers of great beauty. M. crystallinum, whose leaves glisten and sparkle, is the Ice Plant; it is used for lines in carpet beds and for garnishing dishes. The majority are grown in the greenhouse. They thrive in sandy loam with a third of leaf mould and a little lime, and are propagated by cuttings, taken with a heel, dried in the sun, and inserted in sandy soil. Coccineum, scarlet, July, 1 ft.; cordifolium variegatum, a variegated trailer useful for bedding; pyropeum (syn. tricolor), pink, May, 6 ins., are a few of the best.

Mespilus, Medlar (mēs-pilus, from *mesos*, half, and *pilos*, ball, in allusion to the shape of the fruit).—*See* Fruit.

Mezereon.—*See* Daphne.

Michaelmas Daisy.—*See* Aster and Flower Garden—Herbaceous plants.

Michauxia (michāū-xia, after M. Michaux. Ord. Campanulaceae).—M. campanuloides is a fine hardy plant, with large white or pale pink Campanula-like flowers. It is not particular as to soil, and may be propagated by seed or division in spring. It grows about 4 ft. high, blooms in July, and is best treated as a biennial (*see* Biennials). *See* the *Botanical Magazine*, t. 219.

Microlepia.—*See* Davallia.

Mignonette (Reseda odorata).—A perennial grown almost exclusively as an annual, because it comes so readily and flowers

so quickly from seed. It is unnecessary to speak of its delicious perfume. Mignonette thrives well on limestone as well as on most other soils; where it does not bloom freely lime may be added with advantage. Nice pots of Mignonette may be had by sowing about a dozen seeds in a 5 or 6-in. pot in spring and successionally till September, thinning the seedlings to half a dozen. They should be given short stakes. The following are good varieties: Giant Red, Giant White, Giant Yellow, Golden Queen (dwarf), Miles's Spiral; the last is good for pots.

Mildew.—A fungus which attacks Roses and other plants outdoors, and many plants under glass. Dusting with flowers of sulphur, preferably through a pair of Malbec bellows, should be tried, or the affected plants may be sprayed with perfectly fresh liver of sulphur (sulphide of potassium), at the strength of ½ oz. per gallon of water for outdoor plants, and 1 oz. per 3 gallons for indoor plants. The liquid is green and foul-smelling, but harmless to vegetation.

Milfoil.—*See* Achillea.

Milk Vetch.—*See* Astragalus.

Milla (mīl-la, after Señor Milla. Ord. Liliaceae).—Pretty bulbs, allied to Brodiaeas. Biflora, with white flowers in spring, is the most popular species; it grows 18 ins. high, and is good for a cool greenhouse (*see* the *Botanical Register*, t. 1555). Uniflora is now called Brodiaea uniflora. It has white flowers in early spring, height 9 ins. (*see* the *Botanical Magazine*, t. 3327); violacea is a lilac variety. They like sandy loam, and are propagated by offsets.

Millipedes.—Small, quick-moving, many-legged creatures belonging to the genus Julus. They do not hurt plants as a rule, but if they are present in large numbers, and injury at the root is suspected, pieces of Carrot may be impaled on sticks and inserted near the plants as traps, to be examined daily.

Miltonia (miltō-nia, after Earl Fitzwilliam. Ord. Orchidaceae).—Beautiful Orchids. The popular species vexillaria used to be grown as Odontoglossum vexillarium. Its flat, roundish-oval flowers are borne freely in a warm greenhouse. The Miltonias should be grown in sandy, fibrous peat and Sphagnum moss. Propagation is by division when new growth starts, which is the best stage for repotting. Liberal supplies of water will be needed through the growing season, but little in winter. The principal Miltonias are candida, brown and yellow, summer, 18 ins.; grandiflora is a large variety; Clowesii, yellow, white, and purple (*Botanical Magazine*, t. 4109); Roezlii, purple, white, and yellow, autumn, 1 ft.; Schroderiana, purple, brown, and yellow, late summer, 1 ft.; and vexillaria, white to rose, spring, 15 ins. (*Bot. Mag.*, t. 6037); there are many fine varieties.

Mimosa, Sensitive Plant (mimō-sa, from *mimos*, a mimic, in allusion to the irritability of the leaves. Ord. Leguminosae).—M. pudica, the only species grown to any extent, has the peculiarity of drooping its leaves when touched, and is therefore an object of

interest. It is best managed as a tender annual, being raised from seed sown in a warm house or frame in spring. Loam, with a third of peat and some sand, suits it. It bears rose flowers in summer, but they are not particularly attractive (*see* the *Botanical Register*, t. 941). It should be noted that the "mimosa" of the spring markets does not belong to the genus Mimosa; it is Acacia dealbata.

Mimulus, Monkey Flower, Musk (mīm-ulus, from *mimo*, an ape, in reference to the wide mouth. Ord. Scrophularineae).—The spotted Mimulus, tigrinus, as we have already seen (*see* Annuals), is much grown as a bedding plant, being raised from seed in winter, planted out in summer, and discarded after blooming. It is a cheerful, showy plant, and has the advantage of thriving in shady places. Cardinalis is a good scarlet Mimulus, height 18 ins. (*see* the *Botanical Magazine*, t. 3560); cupreus, orange, 1 ft., is good. Glutinosus has buff flowers and sticky leaves (*see* the *Bot. Mag.*, t. 354, as aurantiacus). It needs greenhouse culture. The Musk is Mimulus moschatus. This has much smaller flowers, but the whole plant is agreeably scented. It can be raised from seed in spring in a warm house or frame, the seedlings pricked off, potted singly, and repotted as needed. A 5-in. pot is large enough for flowering, and with a small frame of slender laths the plant can be well displayed. When in bloom it may be stood in a room window. It may be further increased by pieces of root. Harrison's is a larger-flowered variety. Although the spotted Mimuluses are perennials they are commonly grown as annuals. M. glutinosus should be grown as a perennial and propagated by cuttings.

Mina lobata, Ipomaea versicolor.

Mint.—*See* Kitchen Garden—Herbs.

Mirabilis, Marvel of Peru (mirāb-ilis, from *mirabilis*, wonderful. Ord. Nyctagineae).—M. Jalapa, the Marvel of Peru, is a showy plant that was once a great flower-garden favourite. It is easily grown as a half-hardy annual, being raised under glass in spring and planted out in June; but it is a perennial. It is not particular as to soil. As bought from seedsmen it gives several distinct colours, and the flowers are fragrant (*see* the *Botanical Magazine*, t. 371).

Mistletoe, Viscum album (Mistletoe comes from the Saxon word *miselta*. Ord. Loranthaceae).—This very interesting parasite is a native of British woods. It was used in Druidical celebrations hundreds of years ago. It is supposed that birds have spread it by feeding on the berries and scraping their bills on the bark of trees. Those who wish to establish it may press the contents of a ripe berry on the under side of a branch towards the end of winter. In cool, moist places it takes readily to the Oak, Apple, Hawthorn, Lime, and Poplar. It is very slow in spreading.

Mistletoe Cactus.—*See* Cactus (Rhipsalis).

Mitchella (mitchēll-a, after Dr. Mitchell. Ord. Rubiaceae).—M. repens is a hardy herbaceous creeper, with white flowers in early summer and small red berries in winter. Sandy peat suits. The running stems may be layered for propagation.

Mock Orange.—*See* Philadelphus and Flower Garden.

Mole.—The mole is a nuisance in gardens, as it burrows under beds and lawns, and throws up mounds of soil. The run should be found, a steel mole-trap set in it with gloved hands, and well covered to exclude light.

Moly (Allium Moly).—*See* Bulbs.

Monarda, Horse Mint, Bergamot (monār-da, after Dr. Monardez. Ord. Labiatae).—The best-known species is didyma, the Sweet Bergamot, Bee Balm, or Oswego Tea. It grows about 18 ins. high and has scarlet flowers in summer (*see* the *Botanical Magazine*, t. 546). Fistulosa, the wild Bergamot, is grown occasionally. Ordinary soil. Propagation is by division in spring.

Moneywort.—*See* Lysimachia Nummularia.

Monkey Flower.—*See* Mimulus.

Monkey Puzzle, Araucaria imbricata.

Monkshood, Aconitum.

Montbretia (montbrē-tia, after M. Montbret. Ord. Irideae).—*See* Bulbs.

Monterey Pine, Pinus insignis.

Monthly Rose, Rosa indica.

Moon Daisy, Chrysanthemum Leucanthemum.

Moraea (morāē-a, after Mr. R. Moore. Ord. Irideae).—Pretty plants resembling small Irises, suited for frame culture or a cool greenhouse. They thrive in sandy loam, and are propagated by division. Bicolor, brown and yellow, summer, 2 ft. (syn. Iris bicolor) (*Botanical Register*, t. 1404); and edulis, violet, spring, 4 ft. (*Botanical Magazine*, t. 613), are two of the most popular.

Morisia (morīs-ia, after Professor Moris. Ord. Cruciferae).—M. hypogaea is a pretty hardy plant suitable for the rockery, bearing yellow flowers in May. It likes sandy loam, and is propagated by offsets or seeds. Growing only 3 or 4 ins. high, and with dense, bright green, much-cut foliage, it is a good carpeter.

Morning Glory.—*See* Ipoma.

Moss.—*See* Lichen.

Mother of Thousands, Saxifraga sarmentosa.

Moth Orchid.—*See* Phalaenopsis.

Mould.—*See* Soil and Mildew.

Mountain Ash, Pyrus Aucuparia.

Mountain Avens, Dryas octopetala.

Mouse-ear Chickweed, Cerastium.

Mowing, Mowing Machine.—*See* Flower Garden—Grass.

Mulberry.—*See* Fruit.

Mulching.—To " mulch " soil is to cover the surface with a light coating of manure, cocoa-nut fibre refuse, or grass, with the object of conserving moisure by checking evaporation. A mulch of manure also feeds the crop near which it is placed.

Mullein.—*See* Verbascum.

Muscari.—*See* Bulbs.

Mushroom.—*See* Kitchen Garden.

Musk Hyacinth, Muscari moschatus.

Mustard and Cress.—*See* Kitchen Garden.

Myosotidium, New Zealand Forget-me-not (myosotīd-ium, from *myosotis*, and *eidos*, like, in allusion to the resemblance to the Myosotis or Forget-me-not. Ord. Boragineae).—A pretty herbaceous perennial, suitable for the rockery, where it likes a cool, shady spot and a peaty compost. Propagation is by division in spring. M. nobilis, the only species, has blue and white flowers in spring, height 18 ins. (*see* the *Botanical Magazine*, t. 5137).

Myosotis (myosō-tis, from *mus*, mouse, and *otis*, an ear, in allusion to the form of the leaves. Ord. Boragineae).—*See* Forget-me-not.

Myrobalan Plum.—*See* Hedge.

Myrtus, Myrtle (mȳr-tus, from *miron*, perfume. Ord. Myrtaceae).—Handsome shrubs, grown mainly for their foliage. They are good for growing in tubs to stand on large verandahs and in spacious conservatories. The common Myrtle, communis, may be grown outdoors in sheltered places. Loam, with a third of leaf mould and some sand, suit. Propagation is by cuttings under a bell-glass in early summer. There are many varieties of the common Myrtle, of which Belgica, flore pleno (double), and variegata may be mentioned. Ugni, pink, is the same as Eugenia Ugni (*see* the *Botanical Magazine*, t. 4626).

Narcissus (narciss-us, after Narcissus, a mythological youth. Ord. Amaryllideae).—*See* Bulbs.

Nasturtium (nastūr-tium, from *nasus*, nose, and *tortus*, tortured, in allusion to the strong smell. Ord. Cruciferae).—The Nasturtium of gardens is a hardy annual, with large, brilliant flowers (*see* Annuals). It has no right to the name, however, for it is a Tropaeolum. Owing to its pungency it was called Indian Cress, and as the common Water Cress is Nasturtium officinale, the name Nasturtium became attached to it.

Navelwort.—*See* Cotyledon umbilicus. Venus's Navelwort is Omphalodes linifolia.

Neapolitan Violet.—*See* Violet.

Nectarine.—*See* Fruit.

Negundo.—*See* Acer Negundo.

Nelumbium (nelūm-bium, from *nelumbo*, the Indian name. Ord. Nymphaeaceae).—The Sacred Bean or Egyptian Lotos, N. speciosum (*see* the *Botanical Magazine*, t. 903), is a beautiful aquatic, with

white, red-tipped, fragrant flowers in summer. There are many varieties of it, such as large white (album grandiflorum), double white (album plenum), striped white (album striatum), double rose (roseum plenum), and Osiris, red. It has edible nuts. N. luteum has yellow flowers, and is also sweet (*see* the *Bot. Mag.*, t. 3753). The Nelumbiums are not perfectly hardy, and should be grown in a shallow tank in a cool house. The roots may be packed in loam and bound round with moss. Planting should be done in late spring, when growth starts, at which stage crowded clumps may be propagated by division.

Nemesia (nemē-sia, Dioscorides' name. Ord. Scrophularineae).—This genus includes both annuals and perennials, but the only species much grown in gardens is strumosa, the form of which called Suttoni is a beautiful dwarf half-hardy annual, of several colours. It is good both for pots and beds. *See* Annuals.

Nemophila (nemōph-ila, from *nemos*, grove, and *philo*, to love, in allusion to the habitat. Ord. Hydrophyllaceae).—*See* Annuals.

Nepenthes, Pitcher Plant (nepēn-thes, from *nepenthes*, to alleviate sorrow. Ord. Nepenthaceae).—These remarkable plants have long, slender, drooping stems, which terminate in hollow, urn-like vessels provided with a cap or lid and containing water. They are consequently well termed Pitcher Plants. The pitchers vary in size and colour. They are hothouse evergreens, best grown in suspended teak baskets, as then the pitchers are seen to advantage. A compost of loam, peat, and Sphagnum moss, with sand, crocks, and charcoal, suits them. Rebasketing should be done towards the end of winter. Throughout the summer they will enjoy abundance of water and should be syringed daily. In autumn and winter less water will be needed. Minimum temperature 60°. The following are good sorts: albomarginata, green, white ring; Curtisi, green, spotted crimson; Rafflesiana, green, spotted brown; Rajah, purple; and sanguinea, red.

Nepeta, Cat Mint, Ground Ivy (nepē-ta, after the Tuscan town Nepet. Ord. Labiateae).—The Nepetas are a genus of little importance, but the variegated form of the Ground Ivy, Glechoma, is worth growing. It is a pretty dwarf plant, with small Ivy-like leaves and dark blue flowers, good for basket culture. Mussini, a taller plant with violet flowers, is also grown. They will thrive in almost any soil, and are increased by division in spring.

Nephrodium (nephrō-dium, from *nephros*, kidney, in allusion to the shape of the spores. Ord. Filices).—An immense genus, containing hundreds of species, some of considerable importance. The genus Lastrea has been added to it. Some of the species are hardy, while others need a greenhouse, and others again a hothouse. Those species with creeping rhizomes may be propagated by division in spring, the others by spores (*see* Ferns for propagation and soil). The following are a few of the principal species: aemulum, the Hay-scented Buckler Fern; var. ramosum is good. Cristatum, the Crested Shield Fern, many varieties, enjoys peat and a boggy site. Decompositum, var. glabellum is good. Erythrosum, a good

room fern. Filix-mas, the Male Fern, scores of varieties. Lepidum, a graceful fern, suitable for table decoration, but should be propagated frequently to get young plants. Molle, a popular market fern; var. corymbiferum is nicely crested. Montanum, the hardy Mountain Buckler Fern, may be grown on the rockery; vars. Barnesii and cristatum are good. Spinulosum, the Prickly Shield Fern; var. dilatatum has many good forms, such as crispum, Howardiae, and Stansfieldii. Thelypteris, the Female Buckler Fern. There are scores of others.

Nephrolepis (nephrolēp-is, from *nephros*, kidney, and *lepis*, scale, in allusion to the covering of the spore cases. Ord. Filices).—Graceful ferns, mostly evergreens of pendent habit, and consequently suitable for culture in baskets. Davallioides and its varieties furcans, furcans plumosa and multiceps, are particularly good for this purpose; they like a warm house, and may be propagated by rhizomes. Bausei and cordifolia are also popular, and may be propagated by the tubers which they produce; the former is deciduous. Exaltata is a good species for a hothouse. Those that produce spores may be increased by that means. Loam, with a third of leaf mould, and sand, suit. The evergreens must be given a little water in winter, and they will take large quantities, both at the root and overhead, in summer.

Nerine (nerī-ne, after Nerine, daughter of Nerius. Ord. Amaryllideae).—*See* Bulbs.

Nerium, Oleander or Rose Bay (nēr-ium. Ord. Apocynaceae).—The Oleander is a well-known shrub, grown in large pots or tubs for the sake of its beautiful double pink flowers. It is not difficult to grow, but it is what gardeners term a dirty plant—that is, much subject to the attack of insects (*see* Aphides). It must be kept clean by regular fumigation or sponging, or it will soon fall into bad health. Propagation is by cuttings in sandy soil under a bell-glass, or in bottles of warm water in spring. Loam, with a fourth of peat and some sand, suits, and repotting should be done in spring. After flowering the shoots may be trimmed and less water given to afford a rest, after which they may be started again. There are several named varieties, differing in hue, but few specialise the plant. It is poisonous.

Nertera depressa, Bead Plant (nēr-tera, from *nerteros*, lowly. Ord. Rubiaceae).—A pretty little plant, the great charm of which is the abundance of red berries, which nestle in the leaves just above the ground (*see* the *Botanical Magazine*, t. 5799). It is a nice creeper for the rockery, but is not quite hardy. Carpet bedders were wont to make use of it. Some gardeners establish it on the trunks of tree ferns. Propagation is by division or seeds. Sandy soil.

Netting.—A supply of tanned fish netting should always be kept in gardens, as it is useful for protecting seedlings and fruit from birds, and in protecting fruit blossom on wall trees from frost.

New Zealand Flax, Phormium tenax.

New Zealand Spinach.—*See* Kitchen Garden.

Nicotiana, Tobacco (nicotiā-na, after M. Nicot. Ord. Solanaceae).—The genus Nicotiana is important economically because from the leaves of the species Tabacum is prepared tobacco. It is not unimportant from the garden point of view, because it contains several useful garden plants, notably alba, generally called affinis, which produces sweet white flowers in abundance; Sanderae, a plant of somewhat similar habit to the latter, but taller and with rose or magenta flowers; and sylvestris, which grows 4 ft. high, and bears white flowers. Alba and Sanderae are best treated as half-hardy annuals (*see* Annuals). Sylvestris may be treated as a hardy perennial. Tomentosa (colossea) is sometimes grown for its handsome foliage.

Nierembergia (nierembēr-gia, after Señor Nieremberg. Ord. Solanaceae).—The species gracilis is generally grown as a half-hardy annual (*see* Annuals); it has white flowers, streaked with purple, in summer, and grows about 9 ins. high (*see* the *Botanical Magazine*, t. 3108). It likes sandy loam and abundance of water. Rivularis is a white-flowered creeper, suitable for pot culture or moist parts of the rock garden (*see* the *Bot. Mag.*, t. 5608).

Nigella, Love-in-a-mist, Devil-in-the-bush (from *niger*, black, the colour of the seeds. Ord. Ranunculaceae).—Pretty hardy annuals. *See* Annuals and Love-in-a-mist.

Nightshade.—*See* Solanum.

Nightsoil.—Human excrement mixed with dry soil or ashes and lime and laid up for a few weeks is a good fertiliser, and may be applied to soil for Green vegetables. *See* Manures.

Nitrates.—Free nitrogen is not available for plants, and cannot benefit them until combined with a mineral to form a nitrate. Nitrate of soda is a popular form. Nitrolim (calcium cyanamide), sulphate of ammonia, and nitrate of potash also yield nitrogen. *See* Manures.

Nitrification.—The process by which non-available nitrogenous matters are converted into compounds that can be taken up by the roots of plants. The process is performed by bacteria, which multiply the most freely in moist, warm, well-drained, friable soil. The object of the gardener should therefore be to improve the mechanical condition of his soil.

Nitro-bacterine.—A laboratory culture of the microbe Pseudomonas radicicola, which takes free nitrogen from the atmosphere and stores it in the form of nitrates in the root-nodules of leguminous crops, such as Peas. Experiments conducted by the Royal Horticultural Society throw grave doubts on the value of the preparation. *See* Manures.

Norfolk Island Pine, Araucaria excelsa.

Norway Maple, Acer platanoides.

Norway Spruce, Picea excelsa.

Nothoclaena, Gold and Silver Maidenhairs (nothoclāē-na, from *nothus*, spurious, and *chlaina*, cloak, from some appearing to have

an involucre. Ord. Filices).—There are a few very useful ferns included in this genus, notably affinis, a hothouse species; Marantae, which also likes a warm house; sinuata; and trichomanoides, white, powdery fronds, a good basket plant. They may be propagated by spores (*see* Ferns), or division of the crowns in spring in the case of those with tufty habit. Peat, with pieces of sandstone and charcoal, suits. They must have plenty of water in the soil during the growing season, but not overhead. A light, airy position is desirable.

Nuphar, Yellow Water Lily, Brandy Bottle (nū-phar, from the Arabic name *neufar*. Ord. Nymphaeaceae).—Nuphar luteum is a hardy British plant, with yellow flowers in June. It may be established in a pond by binding loam and moss round the roots, and weighting with a stone to sink the mass. Propagation is by division in spring. Advena also bears yellow flowers in summer.

Nut.—*See* Corylus and Fruit.

Nycterinia (nycterīn-ia. Ord. Scrophularineae).—Seedsmen offer Nycterinia selaginoides, a dwarf half-hardy annual with blue and white perfumed flowers in summer, but botanists do not keep up the name. For culture, *see* Annuals—Half-hardy.

Nymphaea, Water Lily (nymphāē-a, after *nymphe*, a water-nymph. Ord. Nymphaeaceae).—Beautiful aquatics, the modern hybrid forms of which are well worth growing, either in shallow ponds, pools, or tubs. *See* Flower Garden.

Oak.—Too large a tree for most gardens, the Oak, Quercus Robur, is nevertheless of interest to garden lovers, because of its fine effect in park and forest. It is, of course, important as a timber tree. The Holm Oak, Q. Ilex; the Turkey Oak, Q. cerris; and the Cork Oak, Q. suber, are not too large for fairly extensive gardens. *See also* Quercus.

Oak-leaved Geranium, Pelargonium quercifolium.

Ocimum Basilicum (Basil).—*See* Kitchen Garden—Herbs.

Odontoglossum (odontoglōs-sum, from *odons*, tooth, and *glossa*, tongue, owing to the tooth-like growths on the lip. Ord. Orchidaceae).—A large and beautiful genus of Orchids. Some of the best kinds will thrive in cool houses, and are inexpensive. Crispum (Alexandrae) is the most popular of all. Many forms of this are as cheap as Fuchsias, although the rarer ones are dear. At least 100 forms of this species alone could be named, all of which would be acknowledged by experts as good. Like most of the Odontoglossums it is a moisture-loving Orchid, and must never be kept dry at the root, even in the winter. In summer there must be abundance of root and atmospheric moisture. The plants are grown in pots, in a compost of peat and Sphagnum set on a base of crocks that two-thirds fills the pot. The pseudo-bulbs should be above the brim of the pot. When new roots show towards the end of summer is a good period for repotting, or it may be done at the end of winter. A minimum winter temperature of 45° will suffice, and this can be maintained without hard firing if the house is adequately piped (*see* Greenhouse—Heating). In hot summer weather steps must be taken

to prevent the plants suffering from sun heat and an arid atmosphere by providing abundant ventilation, by shading, and by damping all surfaces. The plants themselves should not be syringed. For detailed treatment of particular species see a good modern work on Orchids. The following are a few of the best species: citrosmum, rose, white, and yellow, sweet, several varieties. Crispum, white, spotted, but variable in colour; scores of forms are known, for which consult a special work. Edwardi, purple and yellow, sweet. Grande, yellow and brown, very large and brilliant, several varieties. Hallii, yellow and chocolate, many forms (*Botanical Magazine*, t. 6237). Harryanum, brown, white, and yellow, several varieties. Luteo-purpureum, yellow and brown, many varieties. Maculatum, chocolate, yellow, and white, several varieties. Nobilis (syn. Pescatorei), white, spotted red, many forms. Pulchellum, purple, yellow, and white, sweet (*Bot. Mag.*, t. 4104). Rossii, white, spotted brown; majus is a popular variety, and there are several others. Triumphans, yellow and brown, several varieties. Uro-skinneri, yellow and brown. Vexillarium is now known as Miltonia vexillaria (*see* Miltonia).

Oenothera, Evening Primrose (Oenō-thera, from *oinos*, wine, and *thera*, imbibing, owing to the roots being supposed to stimulate drinking. Ord. Onagrarieae).—Popular and brilliant flowers, not all exclusively night bloomers. They are useful border plants, as they will thrive in most soils, are hardy, and bloom freely. They are propagated by seed, the perennials also by division, preferably in spring. All bloom in summer and have yellow flowers except where otherwise stated. The following are a few of the best: biennis, a biennial, 3 ft. high; grandiflora (syn. Lamarckiana) is a large variety of it. Caespitosa, white, 1 ft. (syns. eximia and marginata), a perennial. Fruticosa, 3 ft. (*Botanical Magazine*, t. 332); Youngii is a splendid variety of it; these are perennials. Glauca, 3 ft. (*Bot. Mag.*, t. 1606), a perennial; Fraseri is a good variety. Missouriensis (*Bot. Mag.*, t. 1592), is a yellow perennial trailer. Taraxacifolia, white, also a trailer, is beautiful, but not hardy (syn. acaulis).

Old Man Cactus (Pilocereus senilis).—*See* Cactus.

Old Man's Beard, Clematis Vitalba.

Oleander.—*See* Nerium.

Olearia (oleā-ria, from *olea*, olive tree. Ord. Compositae).—Useful evergreen shrubs. Haastii, which is a dense grower, is hardy, and has attractive white flowers in summer, is particularly good. It grows 4 to 5 ft. high. It may be planted 4 ft. apart in autumn. It is not very particular as to soil, if not stiff and wet. Ilicifolia, also with white flowers, is Musk-scented. Macrodonta is handsome but not quite hardy. Stellulata (syn. Eurybia Gunniana) has beautiful flowers. Propagation is by seeds in a frame in spring, cuttings of mature wood under a hand-light in summer, and by layers in autumn.

Omphalodes, Navelwort (omphalō-des, from *omphales*, the navel, and *eidos*, like, in allusion to the seed. Ord. Borragineae).—A small

genus, comprising one or two very pretty hardy herbaceous plants. Linifolia, a hardy annual, with white flowers, is the Venus's Navelwort; it grows about 9 ins. high. The same popular name is often applied to verna, a dwarf spring-blooming perennial with blue flowers in March. Luciliae is a charming blue summer-blooming Alpine for rockeries (*see* the *Botanical Magazine*, t. 6047). They can be raised from seeds in spring, the perennials also by division; they are not particular as to soil.

Oncidium (oncīd-ium, from *ogkos*, a tumour, in allusion to the growths on the lip. Ord. Orchidaceae).—A large and attractive genus of Orchids, comprising some 300 species, with a large number of varieties and hybrids. They are allied to the Odontoglossums, and the cultural remarks made under that subject apply to Oncidiums, but the species with leathery leaves need less water when the growth is complete, and only enough should be given to keep the pseudo-bulbs from shrivelling. They differ a good deal in respect to heat requirements, and any one who desires to grow a collection should consult a special modern work on Orchids. The following are a few of the principal species: Concolor, yellow, May bloomer, cool house (*Botanical Magazine*, t. 3752). Crispum, brown, summer and winter, cool house (*Bot. Mag.*, t. 3499). Forbesii, brown, margined yellow, autumn, cool house (*Bot. Mag.*, t. 3705). Kramerianum, brown and yellow, spring, hothouse. Macranthum, spring, brown, purple, white, and yellow, cool house. Marshallianum, yellow and brown, summer, cool house. Papilio, red and yellow, spring, hothouse (*Botanical Register*, t. 910). Phalaenopsis, white, purple, and violet, cool house. Sarcodes, brown and yellow, spring, intermediate house. Tigrinum, yellow, barred brown, cool house.

Onion.—*See* Kitchen Garden.

Onoclea (onoclē-a, the Greek name. Ord. Filices).—A small genus of hardy ferns, the finest member of which is Germanica, the Ostrich Fern, also known as Struthiopteris Germanica. This is a noble plant for a sheltered place near the margin of a stream, where its stoloniferous roots can ramble in moist soil. It can be propagated by divisions of these roots. Sensibilis is a much smaller species, growing only about 2 ft. high.

Ononis, Rest Harrow (onō-nis, from *onos*, an ass, and *onemi*, to delight, in reference to the ass's enjoyment of it as food. Ord. Leguminosae).—Two or three members of this large genus are worth growing in the rock garden, notably arvensis, the Rest Harrow, which produces rose and white flowers in summer on stems a few inches high; rotundifolia, a dwarf shrub with rose flowers in summer (*see* the *Botanical Magazine*, t. 335), and the fine variety of the latter called splendens. They are not particular as to soil, and are easily raised from seed in spring, when the perennials may be divided.

Onosma, Golden Drop (onōs-ma, from *onos*, an ass, and *osma*, small, in reference to its attraction for the ass. Ord. Borragineae).—A small genus of charming hardy rock plants, the most graceful of

which is Tauricum, a variety of stellulatum; it grows about a foot high, and produces its charming citron-coloured flowers in May (*see Botanical Magazine*, t. 889). It thrives in limestone and sandy soils if put in positions where damp cannot lodge round the plants in winter. It may be propagated by seeds in spring. Other pretty Onosmas are alba-rosea, which should be raised annually from cuttings; Bourgaei, and echioides; the first has rose and white flowers, the latter pale yellow ones.

Onychium (onȳch-ium, from *onyx*, a claw, in allusion to the shape of the lobes. Ord. Filices).—A small genus of ferns, the most popular of which is Japonicum, a species which loses most of its fronds in winter, but is very graceful when in full growth. It thrives in a compost of peat, loam, and sand, with charcoal, and may be propagated by division. Very little water is needed in winter. Auratum, an evergreen, is also met with; it likes a hot-house.

Ophrys (ō-phrys, from *ophrys*, an eyebrow, in allusion to the sepal fringe. Ord. Orchidaceae).—Interesting Orchids, mostly hardy. Apifera is the Bee Orchis, aranifera the Spider Orchis, bombilifera the Humble Bee Orchis, and muscifera the Fly Orchis. All may be grown in sandy or limestone soil in the rock garden, and may be propagated by division.

Opium Poppy, Papaver somniferum.

Opuntia (Indian Fig, Prickly Pear).—*See* Cactus.

Orange (Citrus Aurantium).—*See* Fruit.

Orchard.—*See* Fruit.

Orchard-house.—*See* Fruit.

Orchids.—At no very remote period Orchids were regarded with something akin to awe by the majority of flower lovers, and were considered to be the monopoly of wealthy people who could afford to construct expensive houses and employ skilled specialists for their plants. The majority of amateurs never felt that they could indulge a homely love for Orchids as they could for Roses, Sweet Peas, and ferns. The plants were, in fact, aliens. That feeling has now become modified considerably, and we begin to find amateurs of small means growing Orchids. It must be admitted that the plants need special study, and that the majority require more heat and moisture than other plants grown under glass. The reason of this is that they come from tropical countries, where the atmosphere is saturated and highly heated. There are, however, certain Orchids which may be grown under cool conditions, and so far from these being species of no importance they include Cypripedium insigne and its varieties and hybrids, which are among the most popular with the cognoscenti. Disa grandiflora is an Orchid that will thrive in a cool house, and another is the beautiful honey-scented Zygopetalum Mackayi, a graceful plant blooming in winter. The lovely Odontoglossum crispum, of which there are many exquisite forms, also thrives under cool conditions. Orchids are all distinguished by flowers of stout texture, and this means that they

last well when cut. The majority have a refined appearance wanting in most other flowers. The different kinds are grown in pots, pans, or baskets, and on blocks, according to their habit. The terrestrial kinds are grown in fibrous peat and Sphagnum moss, with a little charcoal, and the pots or pans are liberally drained with crocks; the epiphytes are grown in baskets with a little moss, or bound with wire on blocks and hung in a warm, moist house. The majority have a resting and a growing season; in the former they require very little water, in the latter a great deal. Most form what are called pseudo-bulbs, fleshy swellings between the collar and the leaf. In a state of nature these store moisture in the rainy season for use in the dry period. The principal Orchids are Cattleyas, Cypripediums, Dendrobiums, Odontoglossums, and Oncidiums. These and others are dealt with under their own names in this work. Orchid flowers differ from others in several important particulars. The stamens and pistil are combined in the column; there is only one anther, except in the Cypripediums, which have two; and the pollen is in masses, not in dust-like grains. The third inner segment, known as the labellum or lip, is generally the most prominent feature; in Cypripediums it forms a pouch; and the two lower sepals are merged into one.

Orchis (ōr-chis. Ord. Orchidaceae).—The hardy Orchids are an interesting class, and some are natives of Great Britain. The majority do well on a limestone soil, and on stiff land chalk should be added. They enjoy cool, shady spots. Transplanting and division are best done in autumn, as they flower in spring. The following are a few of the best: foliosa, 2 to 3 ft. high, purple (*Botanical Magazine*, t. 5074); latifolia, 1 ft., purplish-red, the Marsh Orchis; the Glasnevin variety of this is a handsome spotted form; there is also a white called alba; maculata, 1 ft., purple and white; there is a fine form of it called superba; militaris, 1½ ft., purple, the Soldier Orchis; morio, 9 ins., purple, the green-winged Meadow Orchis; papilionacea, purple, the Butterfly Orchis; and purpurea, 1 to 2 ft., purple. *See also* Ophrys.

Oreocome Candollei (oreocō-me. Ord. Umbelliferae).—A handsome plant with fern-like foliage, sometimes used for summer bedding. It is best kept in pots in winter in plain soil, to check its natural grossness. A good deal of water is required. Propagation is by cuttings or seed. It is synonymous with Selinum tenuifolium.

Origanum (Marjoram).—*See* Kitchen Garden—Herbs.

Ornithogalum, Star of Bethlehem (ornithŏg-alum, from *ornis*, bird, and *gala*, milk. Ord. Liliaceae).—*See* Bulbs.

Ornus (Flowering Ash).—*See* Fraxinus.

Orobus, Bitter Vetch (ōr-obus, from *oro*, to excite, and *bous*, an ox, in reference to its supposed stimulating virtues as food. Ord. Leguminosae).—One or two of these hardy herbaceous perennials are good enough for the garden, notably vernus, purplish-blue, a spring bloomer growing about a foot high, and suitable for the rockery; there are several varieties of it, differing in colour (*see* the

Botanical Magazine, t. 521). Pannonicus, with purple and white flowers in May, 1 ft. high, is also useful. They thrive in light loamy soil, and are propagated by seeds or division in spring.

Osmanthus (osmān-thus, from *osme*, perfume, and *anthos*, flower. Ord. Oleaceae).—Evergreen shrubs, of which ilicifolius, a variety of Aquifolium, is the best; there are several forms, differing in the shape and colour of the leaves, including one with variegated foliage. Fragrans (syn. Olea fragrans) has white perfumed flowers, and not being quite hardy is sometimes grown in pots. They like sandy loam, and may be propagated by cuttings inserted in sandy peat.

Osmunda, Royal Fern (osmūn-da, a Celtic deity. Ord. Filices).—The Osmundas are among the most stately of ferns, and some are hardy. The clusters of sporangia near the tips of the fronds have earned for them the name Flowering Fern. Regalis is the finest of all, and this makes a noble companion for the Ostrich Fern in a cool, sheltered, humid spot at the waterside, where it may be found at a height of 7 or 8 ft. It is the handsomest of all the British ferns, and there are several forms of it, notably cristata, gracilis, and palustris. Bipinnata and cinnamomea are handsome Osmundas, but they are not hardy.

Ostrich Fern.—*See* Onoclea.

Ostrowskia magnifica (ostrŏw-skia. Ord. Campanulaceae).—A beautiful Campanula-like hardy herbaceous perennial, growing 3 to 5 ft. high, and bearing large pale blue flowers in summer. It likes a sheltered but sunny spot, and a friable loamy soil, with water in dry weather. Propagation is by seeds in spring. It seeds freely where it makes itself at home.

Otaheite Orange.—*See* Greenhouse—Orange.

Ourisia (ourīs-ia. Ord. Scrophularineae).—A small genus of hardy herbaceous perennials, one species of which, coccinea, is a beautiful little plant, bearing its scarlet flowers in abundance in summer on stems about a foot high. It loves moist, peaty soil in a shady place. Propagation is by seed and division in spring. *See* the *Botanical Magazine*, t. 5335.

Ouvirandra, Lattice-leaf Plant (ouvirān-dra, from the native name for water-yam, *ouvirandrano*. Ord. Naiadaceae).—A singular aquatic, whose lace-like, transparent green leaves are of great interest and no little beauty. It should be planted in loam and submerged in water that is kept lukewarm, and should be given a shady position in a warm house. The species is fenestralis, and modern botanists call it Aponogeton fenestralis.

Ovary.—The part of a flower, lying below the pistil, which contains the unfertilised seeds, called ovules. In plants where it is formed within or above the petals it is called a superior ovary; where behind or below, inferior. The ovary is considered to have developed, like the petals, from a leaf.

Oxalis, Wood Sorrel (ŏx-alis, from *oxys*, acid, in allusion to the acidity of the leaves. Ord. Geraniaceae).—A large genus, variable

in duration, some being annuals and others perennials. The majority are low growers and ramble freely, so that they may be used for rockwork or for hanging pans. The three-fold character of the foliage of the species Acetosella has led to its being sold as Shamrock; the flowers are white, and are produced in spring; the plant will thrive in a cool, shady part of the rockery. Beyond this the most popular species are cernua, spring, greenhouse, yellow, good for hanging pans; corniculata rubra, yellow flowers and purple foliage, hardy; Deppei, red flowers in spring, greenhouse; floribunda, rose, greenhouse, spring, perhaps the most generally useful of all (*see* the *Botanical Register*, t. 1123); Ortgiesii, yellow, greenhouse, summer; purpurata (syn. Bowieana), purple, greenhouse, autumn; and rosea, rose, greenhouse, spring (*Botanical Magazine*, tt. 2145 and 2830). The hardy kinds will thrive in ordinary soil. Those in pots or pans may have loam, lightened with leaf mould and sand. Several are tuberous and form offsets, by which they may be propagated; the herbaceous sorts may be divided.

Ox-eye Daisy, Chrysanthemum Leucanthemum.

Oxlip, Primula elatior.

Oxyura (oxyū-ra. Ord. Compositae).—O. chrysanthemoides is a yellow hardy annual, synonymous with Layia Calliglossa. For culture, *see* Annuals.

Paeonia, Paeony (paeō-nia, after Dr. Paeon. Ord. Ranunculaceae).—*See* Flower Garden.

Palm, Date, Phoenix dactylifera.

Palma Christi, Ricinus communis.

Palms.—These noble plants serve several useful purposes. As large specimens they are good for forming bold groups in conservatories and halls and on platforms; while as small plants they are good for rooms. They are distinguished by broad, generally deep green and often elegantly cut leaves. In most cases they are easy to grow, but all are not equally suitable for growing into large specimens or for rooms. They are raised from seed, which are put in pots and plunged in bottom heat. The majority will thrive in a compost of loam (3 parts), leaf mould or decayed manure (1 part), and sand. Nice plants can be grown in 6-in. pots. They do not need frequent repotting, and it should only be done when the pots get crowded with roots; in this case act in spring. The pots should be well drained (*see* Drainage), as a good deal of water will be required in the growing season. Very little need be given in winter. It is an aid to keeping room palms healthy to stand them outside when a soft shower is falling in summer. Otherwise the foliage should be sponged once a week with soft, lukewarm water. Weak liquid manure may be given once a week when the plants are well rooted. Soot-water, with half an ounce of superphosphate per gallon, is excellent. The following are useful palms: Areca (or Chrysalidocarpus) lutescens (*r*), Chamaerops humilis, Cocos Weddeliana, Geonoma gracilis (*r*), Kentia (or Howea) Belmoreana (*r*), K. Forsteriana, Latania borbonica (Livistona chinensis) (*r*), Livi-

stona australis, Phoenix canariensis (*r*), P. reclinata, P. rupicola, and Trachycarpus excelsa (*r*). Those marked (*r*) are good for rooms. Cocos Weddeliana is a good table palm, and Chamaerops humilis is suitable for planting out in summer.



PROPAGATING PANDANUSES BY OFFSETS.
1. Drainage. 2. Soil.

Pampas Grass.—*See* Gynerium.

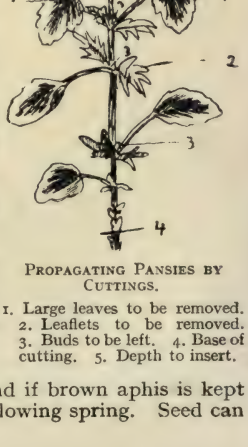
Pancratium (pancrā-tium, from *pan*, all, and *kratys*, potent—supposed medicinal value. Ord. Amaryllideae).—*See* Bulbs.

Pandanus, Screw Pine (pandā-nus, from the Malay name *pandang*. Ord. Pandaneae).—Handsome foliage evergreens, with pointed, strap-shaped leaves, some variegated. They are useful for introducing to conservatory groups on special occasions, and for table decoration. Loam, with a fourth of peat and some sand, suits them. They may be propagated by suckers in bottom heat in a hothouse. They like a light position, and only need shade from strong sun. The house should be vaporised occasionally to keep down insects. The following are a few of the best: Baptistii, green and yellow; Sanderi, green and yellow; and Veitchii, green, banded with white.

Panicle.—An inflorescence, the branches of which are divided irregularly.

Panicum (pān-icum, from *paniculum*, a panicle. Ord. Gramineae).—Graceful Grasses, suitable for pot culture, and easy to grow. They thrive in loam, with a third of leaf mould and some sand, and are easily propagated by division. The most popular species is variegatum, a graceful green and white trailer suitable for pot culture in the greenhouse; botanists now call it Oplismenus Burmannii. It must not be confused with P. virgatum, which is a hardy perennial with silvery leaves.

Pansy (Viola tricolor).—One of the greatest garden favourites, growing in most soils that are not very poor and dry, and easily propagated by seeds in spring, and by cuttings in autumn. The seeds are best sown in boxes in February or March, and the plants started in a frame or greenhouse, then pricked out into other boxes and put out in May. A dressing of cow manure improves the soil, and supplies of liquid manure will help the plants to continue growing and flowering. Suckers from the base may be inserted 3 ins. apart in a cold frame in early autumn, and if brown aphis is kept under they will make good flowers the following spring. Seed can



PROPAGATING PANSIES BY CUTTINGS.
1. Large leaves to be removed. 2. Leaflets to be removed. 3. Buds to be left. 4. Base of cutting. 5. Depth to insert.

be bought in separate colours, to come true. The named tufted Pansies, or hybrid Violas, are not, as a rule, available from seed, and are propagated by suckers like the other Pansies. These make beautiful lines and beds if planted in April in fertile soil and given liquid manure and mulching. They continue to flower best if the blossoms are picked frequently. Archie Grant, plum; Countess of Hopetoun, white; Lark, cream, Picotee edge; Ithuriel, azure; Royal Sovereign, yellow; Primrose Dame, light yellow; True Blue, blue; J. B. Riding, mauve; and Wm. Neil, lavender, are a few good varieties. The Pansy is an exhibition flower of some importance in Scotland, where two classes, Show and Fancy, are grown. The latter have the largest and most richly marked flowers. Alice Lister, Constance Abercromby, James McNab, Mrs. Ferguson, Mrs. J. Sellars, Mrs. Wm. Sinclair, Neil M'Kay, and Robert M'Caughie are beautiful varieties.

Papaver, Poppy (papā-ver, from *papa*, thick milk or juice. Ord. Papaveraceae).—Few garden flowers are more familiar than the brilliant if fleeting Poppies, both the annual and the perennial kinds being esteemed. The Shirley Poppies, with their pretty shimmering flowers, are among the most charming of annuals; they originated from the Corn Poppy, P. Rhoeas. The double Paeony-flowered Poppies came from P. somniferum, the opium Poppy, a tall annual. These doubles are splendid plants, growing 2 to 3 ft. high, and bearing large, brilliant flowers which last better than the singles. The Iceland Poppy is P. nudicaule, a dwarf grower suitable for grouping in the rock garden; there are orange, yellow, and white forms; this plant is best treated as a biennial (*see* Biennials). *See* the *Botanical Magazine*, t. 1633. Orientale, of which bracteatum is a good form, is the grand oriental Poppy, a perennial with brilliant flowers; many named varieties are now offered by florists (*see* the *Bot. Mag.*, t. 57). Umbrosum, scarlet with black spots, is a handsome Poppy; it may be grown either as an annual or a biennial. The Poppies will thrive in almost any soil. Propagation is by seeds, and in the case of the perennials also by division and root cuttings.

Paradisea.—*See* Anthericum.

Paraffin.—Paraffin oil, or petroleum, is useful to the gardener as an insecticide, especially when combined with soft soap to form an emulsion and well diluted with water. The soap should be boiled, the paraffin stirred in while the solution is hot, and the whole churned up in a tub of water by means of a syringe. A pound of soft soap and half a pint of paraffin suffice for 6 gallons of water. Paraffin oil may be dabbed on to patches of American blight in a crude state with a small brush, but it should not be allowed to run on the bark.

Paris Daisy.—*See* Chrysanthemum frutescens (Marguerite).

Paris Green.—An arsenical compound, once much used by fruit growers for spraying on to trees in spring for the purpose of poisoning caterpillars, but now discarded by many in favour of arsenate paste. If used, it should not be at a greater strength than 1 lb. to

200 gallons of water, and it must be kept well mixed, or it will destroy the foliage. *See* Fruit enemies.

Parnassia (parnāss-ia, after Mount Parnassus. Ord. Saxifrageae).—A pretty British bog plant, with white flowers in summer. *See* Flower Garden.

Parrot-beak Plant, Clianthus.

Parsley.—*See* Kitchen Garden.

Parsley Fern, Cryptogramme crispa.

Parsnip.—*See* Kitchen Garden.

Partridge Berry.—*See* Gaultheria.

Passiflora, Passion Flower (passiflō-ra, from *passio*, suffering, and *flos*, flower, the flowers suggesting the Crucifixion. Ord. Passifloreae).—Beautiful and interesting climbers, of which the best known is caerulea, the Passion Flower; it bears its familiar purple, blue, and white flowers in summer (*see* the *Botanical Magazine*, t. 28). The white variety, Constance Elliott, is nearly as popular as the blue. These Passifloras are so nearly hardy that they may be risked outdoors except in cold, exposed places, and may be used on arches and pergolas. They may be propagated by cuttings of young shoots under a hand-light or by seeds sown as soon as ripe in a frame or greenhouse. Of the tender Passifloras, edulis, with purple and white flowers in summer, and edible fruits called Granadillas, likes a hothouse; incarnata, purple, green, and white, an herbaceous perennial that will thrive in the greenhouse; and quadrangularis (*Botanical Register*, t. 14), violet, red, and white flowers in autumn, followed by greenish edible fruits if the flowers are impregnated by hand, likes a hothouse, are the best known. They are better planted out than in pots, so long as the border is not made so large and rich as to encourage luxuriance, which is inimical to flowering. Equal parts of loam and peat, with sand, suit. Young shoots may be struck in heat in summer if kept close. Thin the growths after flowering to prevent crowding. Avoid tying the shoots in stiffly.

Paths.—*See* Walks.

Paulownia (paulō-wnia, after a member of the Russian dynasty. Ord. Scrophularineae).—Imperialis is a handsome deciduous tree from Japan, growing 3 to 4 ft. high, and with large leaves, which make it suitable for bedding out. It likes a loamy soil. Propagation is by cuttings of young shoots in summer, inserted in sandy soil under a hand-light, or in a frame. In cold districts a sheltered place should be provided.

Pea (Green).—*See* Kitchen Garden.

Pea, Sweet.—*See* Sweet Pea.

Peach.—*See* Fruit.

Peacock Iris, Iris Pavonia.

Pear.—*See* Fruit.

Peat.—Compressed and decomposed vegetable matter. There are lowland and upland peats; the former are used for fuel, the latter,

which is sandy, for potting composts and for Azaleas, Rhododendrons, and other peat-loving plants. Brown fibrous peat is preferred for Orchids. The different kinds of peat can be bought at nurseries and from dealers in horticultural sundries.

Pelargonium, Stork's-bill (pelargō-nium, from *pelargos*, a stork, in allusion to the seed pod. Ord. Geraniaceae).—A large and important genus, which includes the popular Zonal Geranium (*see* Geranium, Zonal). The plants generally grown under the name Pelargonium have plain green leaves, somewhat cupped and fringed, but not zoned or variegated. They are free blooming, and the colours are brilliant, so they are well worth growing. Like the Zonal they were more important in past years than they are now, and when florists grew them for exhibition they made various classes, such as Show, Regal, and Fancy, according to the type of flower. The plants are kept exclusively for pot culture. They are grown in warm greenhouses, and sometimes put in room windows when in bloom. After flowering they are stood in a sunny place outdoors, and water is withheld, thus bringing growth to a standstill. After a brief rest the branches are pruned back to short stumps, the plants are watered, syringed, replaced in the greenhouse, and started into fresh growth. Plants in 6-in. or 7-in. pots may grow nearly a yard through. Loam, with a fourth of decayed manure and some sand, suits them. They may be propagated by cuttings of the prunings, inserted in sandy soil in a frame. Loam, with a third of dried cow manure and some sand, suits. Very little water is needed in winter, when they should have a light place in a greenhouse. Staking and tying will be needed, as each branch must be clear of its neighbour. The following are good varieties:—



PRUNING SHOW PELARGONIUMS.

After flowering water is withheld, and as soon as the stems ripen the plants are cut back as shown. Fresh growth will start from the base.

Show.	*Decorative.*
Achievement	Eucharis
Blue Beard	Triomphe de St. Mandé
Marguerite	Volonté Nationale
Royal Ascot	,, ,, album
Fancy.	*Regal.*
Bridesmaid	Bush Hill Beauty
Delicatum	Madame Thibaut
Roi des Fantaisies	Persimmon
Sims Reeves	Princess Beatrice

The *Cape Pelargoniums* are an interesting class. Some have handsome foliage, others have scented leaves. They are less grown now than they used to be, but one meets with them occasionally. The majority are evergreen shrubs, but a few are herbaceous; all need a greenhouse. Capitatum, rose flowers in June, has Rose-scented

leaves. Citriodorum, white, summer, is Citron-scented. Fragrans, white, veined red, summer, has a smell of nutmeg. Radula, purple, June, is Balsam-scented. Tomentosum, white, summer, smells of peppermint. Quercifolium is interesting as having Oak-shaped leaves, and Inquinans and Zonale as parents of the popular Zonal Geranium. Endlicherianum differs from the majority in being herbaceous. All may be grown in a large, cool, airy greenhouse or conservatory, and need little water in winter. Loam, with a third of leaf mould, and sand, suits. Propagation is by seeds in spring or cuttings in autumn. *Ivy-leaved Pelargoniums* are popular, both for garden and pot culture. They make beautiful beds, and are also suitable for hanging baskets and pillar vases on balconies and at the side of steps. Propagation and soil are the same as for Zonal Geraniums (*see* Geranium). Achievement, Beauty of Castle Hill, Jeanne d'Arc, Madame Crousse, Queen of Roses, Ryecroft Surprise, and Souvenir de Charles Turner are good double varieties. La France and Masterpiece are good singles. Madame Crousse is one of the best bedders.

Pelican Flower, Aristolochia gigas.

Pennyroyal.—*See* Kitchen Garden—Herbs.

Pentas (pēn-tas, from *pente*, five, the number of petals and stamens. Ord. Rubiaceae).—A small genus of hothouse shrubs, of which only one species is grown to any extent, and that is carnea, a sub-shrub growing about 18 ins. high, with pale pink flowers in autumn and winter (*Botanical Magazine*, t. 4086); kermesina and Quartiniana are varieties of it. Loam with sand and a third of leaf mould suits. Propagation is by cuttings of young shoots in a propagating case.



PROPAGATING PENTSTEMONS BY CUTTINGS.
A cutting prepared in autumn.
1. Depth to insert.

Pentstemon (pentstē-mon, from *pente*, five, and *stemon*, stamen, in allusion to the stamens. Ord. Scrophularineae).—A splendid genus of hardy herbaceous perennials, sometimes sub-shrubby, as they may hold their stems through the winter. The dwarf species are charming for the rockery, while the taller, larger, florists' varieties are magnificent bed or border plants. There are few soils in which they will not thrive, given a fair amount of moisture; while they are easily propagated by seed or cuttings. If the seed is sown in a warm house in winter, the plants hardened in a cold frame in spring, and planted out in early summer they flower well the same year. Cuttings of the best varieties may be taken in autumn, and put in sandy soil in a cold frame; should the plants be too full of bloom to form suitable growths for cuttings, the flower stems may be removed

in late summer and the plants top-dressed to encourage fresh shoots from the base. Beautiful beds of Pentstemons may be had by setting the plants 2 ft. apart; or groups may be formed in the borders. They bear large, bell-shaped flowers on long, arching stems. The following species are good for the rockery: azureus, 1 ft., blue; barbatus (syn. Chelone barbatus—*Botanical Register*, t. 116), 3 ft., scarlet, Torreyi is a variety; glaber, 1 ft., blue (*Botanical Magazine*, t. 1672); Hartwegii, 2 ft., scarlet; gentianoides, 3 ft., violet; Menziesii, 6 ins., purple and red, Scouleri is a mauve variety. Azureus, Hartwegii, and gentianoides are not quite so hardy as barbatus, glaber, and Menziesii.

Perennial.—A perennial is a plant that lives more than two years (*cf.* Annual and Biennial). When flower gardeners speak of perennials they have herbaceous perennials in mind, but, strictly speaking, trees and shrubs are also perennials.

Pereskia.—*See* Cactus.

Pergola.—*See* Flower Garden.

Perilla (perīll-a. Ord. Labiatae).—Half-hardy annuals, of which nankinensis is grown in flower gardens for its purple foliage. For culture, *see* Annuals.

Periploca (perīp-loca, from *periploke*, intertwining. Ord. Asclepiadeae).—One species only is grown to any extent, and that is Graeca, a quick-growing climber with peculiar greenish-purple flowers, suitable for pergolas and arbours. It is hardy, and blooms in summer. It is not particular as to soil. Propagation is by cuttings under a hand-light, or by layers, in autumn (*see* the *Botanical Magazine*, t. 2289).

Peristeria, Dove Orchid (peristē-ria, from *peristera*, owing to the form of the column. Ord. Orchidaceae).—A small genus of Orchids, liking a light hothouse. Elata, the Dove Orchid, with its interesting and fragrant white, purple-spotted flowers in summer, is the best known (*see* the *Botanical Magazine*, t. 3116). It forms large pseudobulbs. It should be grown in a mixture of fibrous loam, peat, and leaf mould in equal parts, with sand, and may be propagated by division. A good deal of water is needed while they are in growth, but little when they are at rest.

Peristrophe (perīs-trophe, from *peristrophe*, turning round, in allusion to the reversed corolla. Ord. Acanthaceae).—Speciosa (syn. Justicia speciosa) is a pretty winter-blooming plant, well worth growing by all who have a warm greenhouse (*see* the *Botanical Magazine*, t. 2722). It grows about 2 ft. high, and bears its purplish-red flowers freely. Loam, with sand and a third each of leaf mould and decayed manure, suits. Propagation is by cuttings inserted in a warm case in spring.

Periwinkle.—*See* Vinca.

Pernettya (pernēt-tya, after Don Pernetty. Ord. Ericaceae).—Pretty evergreens, hardy except in very cold, exposed places, but of slow growth and quite suitable for pot culture. The most popular species is mucronata, the charm of which lies in the pretty berries

which follow the flowers; there are many varieties, and the colours of the berries differ, being white, flesh, pink, red, or purple. They thrive in equal parts of peat and loam. Propagation is by seeds in spring or layers in autumn. Little pruning is required as the habit is naturally close (syn. Arbutus mucronata). *See* the *Botanical Register*, t. 1675, and *Botanical Magazine*, t. 3093.

Petasites (petasī-tes, from *petasos*, umbrella. Ord. Compositae).—Hardy herbaceous plants, the most popular of which are fragrans, the winter Heliotrope, a plant growing about 6 ins. high, with white flowers in late winter; and officinalis, the Butter Bur, 3 to 4 ft., with white flowers in spring. The latter makes a fine plant for the waterside, where its leaves attain to large proportions. They will grow in almost any soil, and may be propagated by division.

Petunia (petū-nia, from *petun*, tobacco (Brazilian). Ord. Solanaceae).—Brilliant plants, with a profusion of large flowers. They are great favourites for bedding, and the double fringed forms are charming for pots. The garden varieties will thrive in almost any soil, and heavy manuring is to be deprecated, as tending to overluxuriance. Propagation is by seeds, which may be sown in a warm frame or greenhouse in spring, and the plants to go outside hardened in a cold frame. Those for pots should be pinched to make them bushy. Special varieties may be propagated by cuttings in autumn in a warm house. Loam, with sand and a third of leaf mould, will suit them. For beds, plant 2 ft. apart, and peg the shoots down. The old species are rarely grown now, seedsmen offering separate colours, unnamed; and also mixtures, both single and double.

Peucedanum (peucēd-anum. Ord. Umbelliferae).—Sativum is the Parsnip. *See* Kitchen Garden.

Phacelia (phacē-lia, from *phakelos*, a bundle. Ord. Hydrophyllaceae).—An unimportant genus, save for the one species campanularia, which is a charming blue hardy Californian annual, growing about 9 ins. high, and of compact habit. (*See* the *Botanical Magazine*, t. 6735.) For culture, *see* Annuals. P. viscida is synonymous with Eutoca viscida (*Bot. Mag.*, t. 3572), and has blue flowers.

Phaenocoma (phaenō-coma, from *phainos*, bloody, and *kome*, hair. Ord. Compositae).—The only species, prolifera, is a handsome greenhouse plant which can be grown into specimens 3 or 4 ft. through, and these when in full bloom are very effective. It is synonymous with Helichrysum proliferum (*Botanical Magazine*, t. 2365). The variety Barnesii is generally preferred to the type as the habit is better; the flowers are deep crimson. Sandy peat is the best soil. Propagation is by cuttings of firm side shoots inserted in a propagating case in summer. Repotting should be done when growth starts in spring. They like cool, airy conditions. The flowers last for many weeks.

Phaio-calanthe.—These Orchids are bigeneric, having been obtained by crossing the two genera Phaius and Calanthe. They may be grown in the same way as Phaius (*see* below). Arnoldiae, yellow and pink; Berryana, rose; and Sedeniana, rose and white, are interesting hybrids.

Phaius (phāī-us, from *phaios*, shining. Ord. Orchidaceae).—A small genus of tropical Orchids, with large, pleated leaves. They differ a good deal in character, some being evergreen and others deciduous. The former need a moist hothouse. The terrestrial species should be grown in fibrous peat and loam in equal parts, sand and a quarter of dried cow manure being added. Humblotii and its white variety alba will thrive in Sphagnum moss to which a little fibrous peat has been added. They may be propagated by division after flowering. They should not be dried off in winter. The Orchids once called Thunias by botanists, and which are deciduous, are now classed with Phaius. These have large flowers, and are very showy. They like a hothouse. They should be potted high in a compost of fibrous peat and loam, equal parts, with sand and a quarter of decayed cow manure. They may be repotted when they start growing in winter, and may be increased by division at that period if required. A good deal of water will be required in summer, but none in winter, when the plants are at rest. Alba (*Botanical Magazine*, t. 3991), Bensonae (*Bot. Mag.*, t. 5694), and Marshalliae are the most popular of the Thunia species, but there are several hybrids, of which superba and Veitchiana are good. Grandifolius, Humblotii, maculatus (*Bot. Mag.*, t. 3960), tuberculosus, and Wallichii are the most popular of the Phaius species, but such hybrids as Ashworthianus, Cooksoniae, Norman, and Owenianus are interesting. For details, *see* a modern work on Orchids.

Phalaenopsis, Moth Orchid (phalaenōp-sis, from *phalaina*, a moth, and *opsis*, like. Ord. Orchidaceae).—Beautiful Orchids, with flowers in long, graceful spikes. They require to be grown in teak baskets on the roof of a warm house. Nothing but crocks and Sphagnum are required, sufficient of the former being first placed in the baskets to raise the crown of the plants above the top; they may be packed in with Sphagnum; basketing should be done when growth starts at the close of winter. From then till early autumn a temperature of 70° to 80° should be maintained. During winter 60° to 70° will suffice. The atmosphere should be kept in a saturated state. A great deal of water will be needed in summer, but not in winter, when it will suffice to give no more than will keep the moss alive and fresh. Shade from hot sun will be necessary in spring and summer. The following are a few of the best species: Lowii, summer, purple, white, and yellow; Lueddemanniana, purple and white; Sanderiana, pink and white, winter; and Schilleriana, purple, rose, white, and yellow, spring, the best (*Botanical Magazine*, t. 5530). There are many varieties and hybrids, for particulars of which, see a modern work on Orchids.

Phaseolus, Kidney Bean (phasē-olus, from *phaselus*, a small boat. Ord. Leguminosae).—*See* Kitchen Garden.

Pheasant's Eye.—*See* Bulbs—Narcissus.

Philadelphus, Mock Orange (philadēl-phus, the Greek name. Ord. Saxifrageae).—Beautiful deciduous hardy shrubs, with large white flowers, fragrant in many species. They are not particular as to soil. Propagation is by layers in autumn, by suckers, or by

cuttings of young wood in a frame in spring. They are excellent subjects for shrubberies. Old wood should be removed after flowering, and new retained for flowering the following year. Of the species, coronarius (*Botanical Magazine*, t. 391), Gordonianus (*Botanical Register*, t. 32), and grandiflorus (syns. latifolius, floribundus, and speciosus) are the best. There are several varieties of coronarius, including a double and two with variegated leaves. Lemoinei is a fine garden hybrid; there is a tall form of this called erectus. Avalanche and Boule d'Argent are two other good hybrids.

Philageria (philagē-ria, a compound name. Ord. Liliaceae).—A small hybrid genus, the only member being Veitchii, the result of a cross between Lapageria rosea (*see* Lapageria) and Philesia buxifolia (*see* below). It is an interesting bigeneric hybrid, with rosy flowers in June. Peaty soil is liked. Propagation is by cuttings in a greenhouse or frame.

Philesia (philē-sia, from *philesios*, lovely. Ord. Liliaceae).—The one species, buxifolia, is a handsome shrub, with red flowers in early summer, not quite hardy, and requiring shelter in cold districts. It likes peaty soil, and may be increased by suckers in spring (*see* the *Botanical Magazine*, t. 4738).

Phillyrea, Box Jasmine (phillȳr-ea, from *phyllon*, a leaf. Ord. Oleaceae).—Handsome evergreen shrubs, not particular as to soil, and easily propagated by cuttings under a hand-light in sandy soil. The best species are angustifolia, decora (*Botanical Magazine*, t. 6800), and latifolia, all with white flowers in May; there are several varieties of the last.

Phlox (phlŏx, from *phlox*, flame. Ord. Polemoniaceae).—Magnificent garden plants, some annual, others perennial. The former are nominally only half hardy, but they may be sown out of doors after mid-April; they are generally grown as half-hardy annuals (*see* Annuals). The perennials are hardy, and will thrive in any fertile soil; they enjoy moisture, but not stiff, heavy, wet soil. Propagation is by division when growth starts, by cuttings in summer, shaded from hot sun, and by seeds in early summer. The taller kinds, varieties of maculata and suffruticosa, make beautiful beds and border groups. The creeping kinds are good for the rockery. The following are a few good Phloxes: amoena, pink, early summer, 6 ins.; divaricata (syn. Canadensis), blue, spring, 1 ft. (*Botanical Magazine*, t. 163), Laphami is a fine lavender variety; Drummondii, annual (*Bot. Mag.*, t. 3441), many varieties, good mixtures are sold by seedsmen; maculata (syn. decussata), one of the parents of our garden Phloxes (*see* selections), purple, early summer, 2 ft.; ovata, red, spring, 18 ins. (*Bot. Mag.*, t. 528); paniculata (syns. acuminata (*Bot. Mag.*, t. 1880) and corymbosa), another parent of our modern Phloxes, purple, late summer, 3 to 4 ft.; reptans, purple, spring, creeping (syns. crassifolia and stolonifera—*Bot. Mag.*, t. 563); and subulata (syn. setacea), purple, spring, 6 ins., many varieties (*see* selections). Glaberrima, red, summer, 2 ft., and its variety suffruticosa, 1 to 2 ft., rose, early

summer, have also probably been used as parents, in this case of the early summer Phloxes, which are dwarfer than the later flowering maculata-paniculata section.

Good Early Summer Phloxes.

Attraction, white, red eye
James Hunter, rose
Lady Napier, white

Good Late Phloxes.

Coquelicot, orange
Crépuscule, white, dark eye
Etna, scarlet
Eugène Danzanvilliers, lilac, white eye
G. A. Strohlein, orange, carmine centre
Tapis Blanc, white

Dwarf Spring Bloomers.

Frondosa, deep rose
Newry Seedling, white, rose eye
The Bride, white
Vivid, rose
(These are varieties of subulata)

Phoenix, Date Palm (phōē-nix, the Greek name. Ord. Palmae).—Canariensis, dactylifera (Date Palm), reclinata, and rupicola are the principal species. For culture, *see* Palms.

Phormium, New Zealand Flax (phōr-mium, from *phormos*, a basket, owing to the fibre being used in basket-making. Ord. Liliaceae).—Handsome plants, with long, slender green leaves, and beautiful panicles of bloom. They are not hardy everywhere, and should have sheltered places in cold districts. Loamy, friable, well-drained soil is desirable. Propagation is by seed or division in spring. Cookianum (syn. Colensoi), green and yellow; and tenax (*Botanical Magazine*, t. 3199), are the two species grown. There are several varieties of the latter; atropurpureum, with purple leaves, and variegatum, variegated, may be named.

Phosphatic Manure.—*See* Manure.

Phyllocactus.—*See* Cactus.

Phyllostachys (phyllostāch-ys, from *phyllon*, a leaf, and *stachys*, a spike. Ord. Gramineae).—One of the three great genera of Bamboos, the other being Arundinaria and Bambusa (*see* Bamboo). Aurea, Henonis, mitis, nigra, and viridi-glaucescens are the most important species.

Physalis, Winter Cherry (phȳ-salis, from *physa*, a bladder. Ord. Solanaceae).—This genus is useful mainly owing to the showy species Alkekengi and Franchettii. In both the coloured bladder-like calyx (" fruit ") gives the plant its beauty. The latter is much the better of the two, and the old Winter Cherry is dropping out in its favour. They are hardy, and may be grown in the border. They are not particular about soil, and may be raised from seed or division in spring. Edulis (correctly Peruviana edulis), the greenish fruit of which is edible, is the Cape Gooseberry; it is not quite hardy.

Phyteuma, Horned Rampion (phytēū-ma. Ord. Campanulaceae).—Hardy perennials, the smaller species of which are suitable for the rockery and the larger for the border. They are not particular as to soil. Propagation is by seed or division in spring. Comosum, blue (*Botanical Magazine*, t. 6478), and Halleri, white, are good dwarf species.

Phytophthora.—Infestans is the fungus which causes what is known as Potato blight or disease. *See* Kitchen Garden.

Phytoptus.—A genus of mites, Ribis (syn. Eriophyes ribis), causes the " big bud " of Black Currants. *See* Fruit.

Picea (pī-cea, from *pix*, pitch, in allusion to the resinous character. Ord. Coniferae).—*See also* Abies, to which the Piceas are closely related, and Spruce. The Piceas include several important timber trees, but their principal value in gardens lies in the horticultural varieties of the Norway Spruce, P. excelsa, and P. pungens. These are prettily tinted, are of neat habit, and grow slowly, so that they are good for garden borders. Amongst the best of the Piceas for garden purposes are excelsa argenteo-spica, which has silver-tipped leaves; e. aurea, with gold-tipped leaves; e. diffusa, very dwarf; e. pygmaea, pyramidal, dwarf; Morinda (Smithiana), one of the hardiest of the Spruces, and, like excelsa, good to plant as a sheltering tree; polita, a good lawn tree; pungens argentea, a silvery form of the Blue Spruce of the Rocky Mountains; p. glauca, a graceful little glaucous plant; and p. pendula, a weeping form of the preceding. These can all be bought from nurserymen at moderate prices. The forest Spruces are sold in quantity very cheaply. The Piceas are not fastidious as to soil, but deep, sandy loam is best. Propagation is by seed sown in spring, but it is perhaps best left to nurserymen.

Picotee.—*See* Carnation.

Pieris (pī-eris, from *Pieria*, the home of the Muses. Ord. Ericaceae).—Handsome evergreen shrubs, suitable for shrubbery borders and special positions on lawns. They are naturally of compact habit. They like sandy peat, and may be propagated by layers in autumn. Floribunda, with white flowers in spring, is the most popular (syns. Andromeda floribunda (*Botanical Magazine*, t. 1566) and Leucothoë floribunda).

Pilea, Artillery Plant (pī-lea, from *pilos*, a cap. Ord. Urticaceae).—Muscosa is an interesting plant. The leaves are finely divided, and the flowers are small and reddish. If sprinkled with water when in full bloom, explosions follow, giving the effect of a miniature bombardment. It likes a warm house. Loam, with sand and a third of leaf mould, suits. Propagation is by cuttings in bottom heat, or by seeds sown in a warm house or frame.

Pilewort, Ranunculus Ficaria.

Pilocereus.—*See* Cactus (Cereus).

Pimelea (pimē-lea, from *pimele*, fat. Ord. Thymelaeaceae).—A genus of minor importance, but occasionally grown in large gardens. With training they make handsome exhibition plants, and are seen in collections of stove and greenhouse plants at some of the larger exhibitions. They like equal parts of peat and loam, with a great deal of sand. Propagation is by cuttings of young shoots, taken with a heel in spring and inserted in sandy peat under a bell-glass in a warm house. After flowering cut back to the hard wood, and repot when fresh growth starts. Rosea (syn. Hendersoni), pink

(*Botanical Magazine*, t. 3721); and spectabilis, white or pale pink (*Bot. Mag.*, t. 3950), are the two best species. Both bloom in late spring or early summer. They will thrive in a warm greenhouse.

Pimpernel.—*See* Anagallis.

Pinching.—The stopping of shoots to encourage the production of side branches and to favour the plumping up of flower buds into leaf buds.

Pine.—*See* Pinus.

Pinguicula, Bog Violet, Butterwort (pinguĭc-ula, from *pinguis*, fat. Ord. Lentibularieae).—Insectivorous plants, flourishing in boggy places; the fleshy leaves are furnished with glandular hairs, and the fluid which exudes traps small insects. The hardy species should be given a site near the bottom of the rockery, where the conditions are cool and humid. The common hardy Bog Violet or Butterwort is vulgaris, which bears violet flowers in early summer. Grandiflora is also hardy. But caudata is the best, and it bears its carmine flowers in autumn (*see* the *Botanical Magazine*, t. 6624). It is not hardy, and should be grown in a greenhouse in a compost of peat and Sphagnum moss. Propagation is by seed or division. A great deal of water is needed.

Pinnate.—A pinnate leaf is one in which several leaflets grow from the sides of one footstalk.

Pinus, Pine (pī-nus, from the Greek. Ord. Coniferae).—The Pines are important both as timber and as garden trees. Among those planted for ornamental purposes are Austriaca (Austrian Pine), Cembra, excelsa, insignis, Lambertiana, monticolor, Pinaster, Pinea, ponderosa, and Strobus (Weymouth Pine). Laricio, the Corsican Pine, and sylvestris, the Scotch Fir or Pine, are almost entirely forest trees. There are good garden varieties of some of these, notably Cembra aurea and C. pumila; Laricio aureo-variegata, green and yellow; L. pygmaea, a bushy form; Pinaster variegata, ponderosa pendula, weeping; Strobus fastigiata, pyramidal; S. nana, dwarf bush; sylvestris aurea, yellow in winter; and s. fastigiata, pyramidal. The Scotch Fir is a good tree for planting in peaty districts. Ponderosa is good for a very dry soil, and Lambertiana for a bleak position. The Austrian Pine looks well in a group, but must not be planted too freely, as it is rather sombre. Propagation is by seed and grafting, but is almost wholly done in the nurseries.

Pipes.—*See* Greenhouse—Heating and Drainage.

Pipings.—Young shoots used for propagating.

Pinks.—*See* under Carnations.

Piptanthus (piptān-thus, from *pipto*, to fall, and *anthos*, flower, alluding to the short life of the blossoms. Ord. Leguminosae).—A small genus of handsome evergreen shrubs, the most important of which is Nepalensis, the evergreen Laburnum. It grows about 8 ft. high, and bears its yellow flowers in spring. It is best against a wall, as it is not perfectly hardy. Light, friable, well-drained

loamy soil is desirable. Propagation is by seeds, cuttings of ripe shoots under a bell-glass in a frame, or layers.

Pistol Plant, Pilea muscosa.

Pisum, Pea (pī-sum, from the Celtic *pis*. Ord. Leguminosae).—Pisum sativum is the Green Pea. *See* Kitchen Garden.

Pitcher Plant.—*See* Nepenthes.

Pits.—*See* Greenhouse.

Plane, Platanus (plāt-anus, from *platys*, broad. Ord. Platanaceae).—One of the most useful of trees, owing to the fact that it thrives so well in the smoke of towns. On this account it has been planted more extensively than any other tree in large cities. What is called the London Plane is P. acerifolia, *i.e.*, the Maple-leaved Plane; Suttneri is a variety of it with deeply cut leaves. P. occidentalis is the Western and P. orientalis the Eastern Plane. There are variegated forms of each. The Plane sheds its bark in winter. It is not particular as to soil, and is of naturally good habit, needing little pruning to keep it in shape. Trees may be planted from November to March inclusive, and should be well staked. *See* Flower Garden.

Plantain, Plantago (plantā-go. Ord. Plantagineae).—A troublesome weed, especially when it gets established on a lawn. It has long, fleshy roots, and breaking off the leaves is not much use unless a little vitriol or sulphuric acid is dropped into the heart afterwards. It is well to spud them out as fast as they appear, and then sprinkle on a little fresh grass and clover seed.

Plantain Lily.—*See* Funkia.

Planting.—*See* Fruit, etc.

Plasmodiophora.—The fungus that causes club-root (anbury) in Green vegetables, and " finger-and-toes " in Turnips. *See* Kitchen Garden.

Platanus.—*See* Plane.

Platycerium, Stag's-horn Fern (platycē-rium, from *platys*, broad, and *keras*, a horn. Ord. Filices).—Handsome and distinct warm greenhouse ferns, with bold fronds, well suited to culture in suspended pans. The receptacle should be half filled with crocks, and the roots packed in with a mixture of fibrous peat and Sphagnum moss, lightened with sand, charcoal, and crocks—treatment that reminds one of Orchids. They like abundance of water. Propagation is by spores or buds on the roots. P. alcicorne, with twice or thrice-forked fronds, is the common Elk's Fern; Hillii and majus are varieties of it. Grande is a fine species.

Platycodon, Chinese Bellflower (platycō-don, from *platys*, broad, and *kodon*, a bell. Ord. Campanulaceae).—The only species, grandiflorum (syn. Campanula grandiflora—*Botanical Magazine*, t. 252), is a fine Campanula-like plant, growing about a foot high, with large blue flowers in summer. It is a hardy herbaceous perennial, suitable for the front of the border, and liking a friable soil. Propagation is by seed or division in spring. There are several varieties, of which Mariesii is one of the best; there is a white form of it.

Platystemon californicus (platystē-mon, from *platys*, broad, and *stemon*, a stamen. Ord. Papaveraceae).—A pretty, hardy, Poppy-like annual, about 1 ft. high, with yellow flowers in summer. For culture, *see* Annuals.

Pleione (Indian Crocus. Ord. Orchidaceae).—Pretty dwarf Orchids, with flowers on short stems. They form pseudo-bulbs annually, and are therefore herbaceous plants. They do well in pans partly filled with crocks, the roots packed in a mixture of fibrous peat and Sphagnum moss, with sand. Repot after flowering, at which time division may be practised. A good deal of water is required when the plants are in full growth, but the supply should be reduced when the plants begin to wither, and withheld altogether in winter. They should be grown in an intermediate house. The principal species is lagenaria, various colours, flowering in winter. Maculata, purple and white, autumn bloomer, is also grown.

Pleroma (plerō-ma, from *pleroma*, fullness. Ord. Melastomaceae).—Evergreen shrubs, which thrive in an intermediate house in a compost of equal parts peat and loam, with a quarter part of sand. Propagation is by cuttings in a propagating case. Elegans, with blue flowers in summer, is now called Tibouchina elegans by botanists. Macranthum (syn. Tibouchina semidecandra), with violet flowers, is also good (*see* the *Botanical Magazine*, t. 5721).

Plum.—*See* Fruit.

Plumbago, Leadwort (plumbā-go, from *plumbum*, lead; used in eye troubles. Ord. Plumbagineae).—Pretty plants, some evergreen, others herbaceous, some hardy, others needing a greenhouse or hothouse. The hardy sorts are not fastidious as to soil. Loam, with sand and a third of leaf mould, will suit the tender kinds. The herbaceous species may be propagated by division in spring, the shrubs by cuttings in a propagating case in spring. Capensis (*Botanical Magazine*, t. 2110), with blue flowers in summer and autumn, is a great favourite; it is sometimes planted out to ramble up a pillar or on a greenhouse roof, in other cases grown in pots and trained on a balloon-shaped wire trellis. After flowering it should be pruned back annually to the old wood; there is a white variety, alba. . Rosea (*Bot. Mag.*, t. 230) and its variety superba, which have rosy flowers in winter and spring in a warm greenhouse, can be made into neat bushes if raised from cuttings, pinched and re-pinched. Larpentae, blue; and micrantha, white, are both hardy herbaceous species and flower in summer.

Podophyllum (podophȳ–llum, from *anapodophyllum*, leaf like a duck's foot. Ord. Berberideae).—Two species of Duck's-foot are grown, viz. Emodi and peltatum. The former is remarkable for its large, reddish, egg-shaped fruits, which are borne in late summer. They are hardy herbaceous perennials, suitable for the rock garden, and are propagated by division in spring.

Poet's Narcissus.—*See* Bulbs.

Poinsettia (poinsētt-ia, after M. Poinsette. Ord. Euphorbiaceae).—A brilliant plant, the carmine bracts of which do duty for flowers,

and do it in a way that the most showy flowers could not excel. They form a large, flattish head of the most vivid colour. The Poinsettia likes a warm, moist temperature, and is hardly suitable for the small "mixed" greenhouse of the amateur. It is best to grow a batch in a hothouse, raising them from pieces of the old stem, which should be cut up and put in sandy soil in bottom heat in spring; or from side shoots taken off when old plants break into growth late in spring, also in bottom heat. Loam, with sand and a third each of leaf mould and decayed manure, suits. They may be inserted singly in small pots, shifted when rooted to 5-in., and from those to 8-in. The plants may be kept in a frame in summer, and



PROPAGATING POINSETTIAS BY PIECES OF OLD STEM IN SPRING.
Note a young growth starting.



PROPAGATING POINSETTIAS BY PIECES OF OLD STEM IN SPRING.
1. Drainage. 2. Soil. 3 Cuttings, each with a bud. Bottom heat should be given.

put in a warm house in late summer to bloom. Pulcherrima is the only species, but there are several varieties of it, major being one of the best. *See* the *Botanical Magazine*, t. 3493.

Poison Oak, Rhus toxicodendron.

Polemonium, Jacob's Ladder, Greek Valerian (polemō-nium, from *polemos*, war, following a dispute concerning it which led to warfare. Ord. Polemoniaceae).—Useful plants for the border and rockery, of which the most popular species is caeruleum, a blue perennial, 2 ft. high, blooming in July. There are several varieties of it, including a white and a variegated. Confertum is a nice rockery plant, with blue flowers in summer, 6 ins. high. Richardsoni (syn. humile), blue, 1 ft., is a good border or rock plant. Reptans bears satiny blue bell-shaped flowers in May; height 9 ins. Sandy loam is suitable. Propagation is by seeds or division in spring.

Polianthes, Tuberose (poliān-thes, from *polis*, a city, and *anthos*, a flower. Ord. Amaryllideae).—*See* Bulbs.

Pollen.—The fertilising grains borne on the stamens of flowers. In most cases the pollen is in separate grains, in Orchids it is in masses. *See* Hybridisation.

Pollination.—The application of pollen to the stigma of a flower. *See* Hybridisation.

Polyanthus.—*See* Primula.

Polygala, Milkwort (polȳg-ala, from *poly*, much, and *gala*, milk. Ord. Polygaleae).—Showy plants, one of the most popular of which

is myrtifolia grandiflora (syn. Dalmaisiana), which produces purple flowers in spring (*see* the *Botanical Magazine*, t. 3616). It is an evergreen and needs greenhouse culture. Propagation is by cuttings of the young shoots in spring under a bell-glass. Peat, with sand and a third of loam, suits.

Polygonatum, Solomon's Seal (polygonā-tum, from *poly*, many, and *gonu*, a joint, in reference to the stem. Ord. Liliaceae).—*See* Bulbs.

Polygonum, Knotweed (polȳg-onum, from *poly*, many, and *gonu*, a joint. Ord. Polygonaceae).—A large genus which comprises some very useful plants, differing widely in habit. P. affine (syn. Brunonis), for example, is a dwarf hardy perennial, with rosy flowers in autumn; while Baldschuanicum is a hardy perennial climber, growing rapidly on trellises and arbours, and bearing a cloud of white flowers in autumn; these are two of the best. Other good hardy species are alpinum, a low rock plant with white flowers in summer; cuspidatum, a tall border perennial with white flowers in summer; and sachalinense, a tall perennial with greenish-white flowers in summer. They will grow in almost any soil, and are propagated by seeds or division in spring.

Polypodium (polypō-dium, from *poly*, many, and *pous*, foot, in allusion to the divisions of the creeping stems. Ord. Filices).—The largest of the fern genera, mostly evergreen, but including a few deciduous kinds. Loam, with sand and a third of leaf mould, suits the majority. Propagation is by spores or division in spring (*see* Ferns). The following may be selected from the hundreds of species: Aureum, needs a warm greenhouse or hothouse; the name comes from the yellow scales on the rootstock; several varieties, Mayi being good. Dryopteris is the British Oak Fern, and is deciduous; it is a prettily cut hardy species; Robertianum is a scented variety of it. Phegopteris is the British Beech Fern, and is partially, though not wholly, evergreen. Picotii, with broad fronds, is a good greenhouse species. Schneideri is a handsome hybrid, with triangular fronds, greenhouse. Subauriculatum is one of the best, and makes a splendid basket fern. Vulgare is the common Polypody or Wall Fern; there are numerous varieties of it.

Polystichum (polȳs-tichum, from *poly*, many, and *stichus*, a row, in allusion to the spore cases. Ord. Filices).—This genus of ferns is now merged in Aspidium. The most popular species are aculeatum and angulare. For culture, *see* Ferns.

Pondweed, Cape, Aponogeton distachyon.

Poplar, Populus (pōp-ulus, the arbor-populi or public tree of the Romans. Ord. Salicineae).—Useful deciduous trees, growing rapidly. The Lombardy Poplar, nigra pyramidalis, is a good town tree, of columnar habit. If young trees are headed at about 8 ft. high they throw out thick clusters of small branches and soon make a screen if planted 6 ft. apart. Alba, of which there are many varieties, is the white Poplar or Abele. Balsamifera is the Balsam Poplar, deltoidea the necklace Poplar, and tremula the Aspen (*see* Aspen). They like well-drained loamy soil, but are not very particular.

The Aspen thrives on clay. The white Poplar likes a moist soil. Propagation is by seeds, layers, and grafting, but is generally left to nurserymen.

Poppy.—*See* Papaver.

Poppy, Californian, Platystemon californicus.

Poppy, Horned, Glaucium luteum.

Portugal Laurel.—*See* Laurel and Prunus.

Portulaca (portulāc-a, from *porto*, to carry, and *lac*, milk. Ord. Portulaceae).—Charming half-hardy annuals, with single and double flowers of brilliant and varied colours, thriving in sunny spots. For culture, *see* Annuals—Half-hardy. P. oleracea is the Purslane, a kitchen herb.

Potato (Solanum tuberosum. Ord. Solanaceae).—*See* Kitchen Garden.

Potato Onion.—*See* Kitchen Garden.

Potentilla, Cinquefoil (potentīl-la, from *potens*, powerful, in allusion to the supposed medicinal properties. Ord. Rosaceae).—Charming plants, several good species and hybrids being hardy and suitable for the border and rock garden. They have Strawberry-like foliage and brilliant single or double flowers. They will thrive in any good garden soil; for the alpines it should be gritty. Propagation is by seeds or division in spring. Ambigua, yellow, 6 ins. high, early summer (*Botanical Magazine*, t. 4613); fruticosa, a shrub 3 to 4 ft. high, yellow flowers in summer; nepalensis (syn. formosa), 18 ins., pink flowers in summer; and nitida, 4 to 6 ins., rose flowers in summer, are a few of the best species.

Pots.—*See* Flower-pots.

Potting.—A gardening operation well worthy of study. As a rule, the first pot of a young plant, whether from seed or cutting, should not exceed 3 ins. across (for this and other sizes, *see* Flower-pots). Unless in special circumstances the shift from this may be to a 5-in., from that to a 7-in., and from that to a 9-in. or 10-in. if further repotting is necessary. Economy in time and material may be effected by shifting from a 5-in. to an 8-in. if watering is carefully done until the plants are rooting freely again (*see* Watering), otherwise the soil might become sour. It is desirable that the pots should be clean inside as well as out; if dirty the roots bind on the bottom and are torn in repotting. Generally speaking, plants need repotting when roots show freely at the drainage hole. The fresh soil should be pressed firmly round the roots. *See also* Drainage and Soil.

Pricking-out.—A term applied to the operation of transplanting seedlings from the pans or boxes in which the seeds were sown. It should be done before the plants spoil each other by crowding.

Prickly Pear (Opuntia).—*See* Cactus.

Primula (Primrose, Polyanthus, Auricula. Ord. Primulaceae).—A large and very important genus, including, as it does, one of our

most valuable winter-blooming indoor plants in the Chinese Primrose, Primula sinensis; the popular greenhouse species obconica, and a host of hardy species, beginning with the common yellow Primrose of the woodland. The Primulas give material to the greenhouse owner, the rock gardener, and the spring bedder. There are now many forms and colours of the Chinese Primrose, and those who have plenty of glass, and want a good selection of sorts, may grow the Fern-leaved as well as the ordinary section, and likewise various distinct colours, perhaps also some doubles. The Star Primulas should not be overlooked. A person with one house might do well to order a packet of mixed seed. By making sowings at intervals in spring in a greenhouse it is possible to get a succession of bloom. The plants thrive in a cool house, or even frame in the summer, and should be kept cool and moist in dry weather. Placed singly first of all in 3-in. pots, they may be transferred to 5-in. and 6-in. Loam, with a fourth of leaf mould, a little dried cow manure, and sand, make a suitable compost. The plants may be set fairly deeply, without, however, burying the leaf stems. They have a tendency to get bare at the collar and rock about; this must be prevented. They will flower in winter and spring. It is rarely worth while to keep old plants after blooming, as they tend to get loose and scraggy. Young stock is much better. Unlike the border Primroses, this species does not form a thick tuft of offsets. The double white Primula obconica (syn. poculiformis) (*Botanical Magazine*, t. 6582) is a beautiful species, good for a greenhouse in summer, and sharing with the Chinese Primrose the merit of doing good service in a room window when in bloom. It should be handled with caution, however, as it causes a painful rash on the hands of some people, while having no ill effect on others. It may be raised from seed in spring.



DIVIDING PRIMROSES AFTER FLOWERING.
This plant may be separated into two or four divisions at will.

Hardy species.—The rock gardener has a splendid lot of material to his hand in the hardy species, which produce charming flowers among the stones. The following are beautiful species, and in the case of most seed is procurable, which may be sown in a frame or greenhouse as soon as it is ripe, or in spring; those of tufty habit may be divided when established; the best time for this is in spring, after flowering: capitata, violet, 9 ins., spring; cortusoides, rose, summer, 6 to 9 ins.; denticulata, lilac, spring, 1 ft. (*Bot. Mag.*, t. 3959), there are several varieties, including cashmeriana; japonica,

crimson, 18 ins., late spring (*Bot. Mag.*, t. 5916); marginata, violet, 3 ins., late spring (*Bot. Mag.*, t. 191); minima, pale rose, 2 ins., summer (*Botanical Register*, t. 581); rosea, rose, 6 ins., spring (*Bot. Mag.*, t. 6437); Sikkimensis, yellow, 2 ft., summer (*Bot. Mag.*, t. 4597); Sieboldii, various colours, 9 ins., spring; viscosa (syn. villosa), rose, 3 ins., summer (*Bot. Mag.*, t. 14). The following are interesting newer species: Bulleyana, orange, 1 ft.; Cockburniana, scarlet, a biennial, best raised from seed annually; Forresti, orange, 1 ft., fragrant; Listeri, lilac, 6 ins., and white variety; Littoniana, lilac to purple, 1 ft.; malacoides, lilac, 6 ins.; pulverulenta, violet, resembles Japonica; Veitchii, rose, like cortusoides; and Winteri, lavender, powdered leaves. Unique and Lissadell Hybrid are beautiful crosses between Cockburniana and pulverulenta. The following are pretty greenhouse species: floribunda, yellow, 6 ins., spring (*Bot. Mag.*, t. 6712); Forbesii, lilac, yellow eye, 6 ins., summer; kewensis, a hybrid between verticillata and floribunda, yellow, 1 ft., spring; verticillata, yellow, 18 ins., spring (*Bot. Mag.*, t. 2842). The double border Primroses, Polyanthuses, Oxlips, and Auriculas are easily raised from seed in spring, and may be planted in autumn to make beautiful spring beds. They may be divided after flowering (*see* preceding page). The Primrose is Primula vulgaris (syn. acaulis), the Auricula is P. Auricula (*Bot. Mag.*, t. 6837), the Polyanthus is a hybrid between Primrose and Cowslip, the Oxlip is P. elatior, the Cowslip is P. officinalis (syn. veris).

Privet (Ligustrum).—*See* Hedge and Ligustrum.

Prunella, Self-heal (prunē-lla, from the German *Die Breaune*, medicinal. Ord. Labiatae).—Hardy perennials, of which the best known is grandiflora, with purplish-mauve flowers in summer, height 6 ins. It is easily grown in the rock garden, and may be propagated by division in spring.

Pruning.—*See* Fruit.

Prunus (prū-nus, from *prune*, a Plum. Ord. Rosaceae).—A large and highly important genus, including as it does such fruits as the Apricot, Cherry, Peach, and Plum; such handsome trees as the Almond; and such shrubs as the Laurel. P. Amygdalus is the Almond, P. Armeniaca the Apricot, P. Cerasus the Cherry, P. Persica the Peach (with which is included the Nectarine), and P. communis the Plum. The fruits are dealt with under Fruit. Several of the Prunuses are grown as ornamental plants, and among these may be named the double red variety of Persica called Clara Meyer; triloba and its double variety, which is a beautiful little tree for forcing in pots; cerasifera atropurpurea (syn. Pissardii), a small tree with purple leaves, good as a standard for the shrubbery and lawn; Cerasus Rhexii flore pleno, the double white Cherry; pseudocerasus (syn. Watereri) and its fine dark variety James H. Veitch. All these may be grown in pots and gently forced into bloom in winter or early spring. Loam, with sand and a third of decayed manure, will suit them. They are also good for the shrubbery.

Pseudo-bulb.—The swollen, bulb-like stem of an Orchid.

Pseudostuga (pseudostū-ga, from *pseudo*, false, and *Tsuga*, a genus. Ord. Coniferae).—This genus is important through containing the Douglas Fir, once called Abies Douglasii, but now called Pseudostuga Douglasi by botanists. There are several varieties of this handsome Conifer, and brevifolia, pendula, glauca, and Stairii may be mentioned as good.

Psila rosae (Carrot fly).—*See* Kitchen Garden.

Psylla.—A small insect, sometimes called the Apple sucker. *See* Fruit enemies.

Pteris, Brake Fern, Ribbon Fern (ptē-ris, from *pteron*, a wing, in allusion to the shape of the fronds. Ord. Filices).—A large and very useful genus of ferns, comprising several of our most popular greenhouse, room, and table kinds. They vary greatly in appearance, and also in requirements, some being hardy while others require a warm house. The indoor species thrive in equal parts of loam and leaf mould, with sand. Propagation is by spores (*see* Ferns). Those which produce creeping rhizomes may be divided in spring. Small plants are charming for dropping into ornamental bowls for side tables. The following are a few of the best: aquilina is the common Brake Fern or Bracken, and is hardy; cristata is a crested variety of it. Cretica and its varieties form a popular set; the type has pale green leathery fronds, and succeeds in a warm greenhouse or fernery; albo-lineata, with central band of silver; Mayi, crested; and Wimsetii, tips forked and crested, are good varieties of cretica. Ensiformis Victoriae is prettily variegated. Quadriaurita is a handsome species; its variety argyraea is variegated, while rubricaulis has red stipes. Serrulata is a graceful species which likes a warm house; its variety cristata has crested fronds, and is very popular in the markets and for table decoration. Tremula is one of the best ferns we have for a greenhouse or room, and there are several nice varieties of it, notably elegans, flaccida, and Smithiana. Umbrosa and its variety cristata are also worth growing. Longifolia, a greenhouse species, is a popular fern, much grown for the markets.

Puccinia (puc-cīn-ea).—A genus of injurious fungi, attacking many plants, notably Carnations ("rust"), Chrysanthemums ("rust"), and Hollyhocks ("disease"). *See* the various plants named for remedies.

Pulmonaria, Lungwort (pulmonā-ria, from *pulmonarius*, owing to its supposed value in lung diseases. Ord. Boragineae).—Useful hardy perennials, suitable for the border. Officinalis, the reddish-violet Bethlehem Sage, is the best known; it grows about a foot high, and blooms in spring; there is a white variety; the leaves are spotted with white. Any good garden soil will do, and propagation is effected by division in spring. Sibirica is synonymous with Mertensia sibirica, and Virginica with M. pulmonarioides (*see* the *Botanical Magazine*, t. 160).

Purslane.—*See* Portulaca.

Puschkinia scilloides (puschkīn-ia, after M. Puschkin. Ord. Liliaceae).—A pretty little Scilla-like bulb (*see* the *Botanical Magazine*, t. 2244), growing about 6 ins. high, and bearing white flowers striped with pale blue in spring; compacta (syn. libanotica compacta) is a variety, and may be grown in pots if desired. They will thrive in well-drained garden soil, and are propagated by offsets. They are charming little bulbs for the rockery.

Pyrethrum, Feverfew (pyrē-thrum, from *pyr*, fire, in allusion to the acridity of the root. Ord. Compositae).—A large and important genus, separated from Chrysanthemum by so narrow a line that modern botanists have brushed it aside and merged the two. The most important to the flower gardener are the single and double varieties of roseum, which florists have developed; these are early growers and bloomers, have beautiful flowers, and will bloom a second time if cut back after the first flowering. They are grand plants for herbaceous borders, growing 3 ft. high or more in good soil, and bearing large quantities of flowers. They will thrive in most soils, and are easily propagated by splitting up the clumps when they start growing, which may be at midwinter. Parthenifolium aureum is the Golden Feather (*see* Golden Feather). Parthenium, with white flowers in early summer, is the common Feverfew. Tchihatchewii, a dwarf plant with white flowers in summer, is a good plant for dry banks. Uliginosum is a tall, late-blooming perennial with white flowers. *See also* Chrysanthemum. The following are good varieties of Pyrethrums:—

Single.	*Double.*
Decoy, scarlet	Carl Vogt, white
Oliver Twist, cream	King Oscar, scarlet
Roland, lilac	Ovid, rose

Pyrola, Wintergreen (pȳr-ola, from *Pyrus*, Pear tree, in reference to the form of the leaf. Ord. Ericaceae).—Hardy herbaceous perennials, useful for the rockery. Rotundifolia is the best-known species; it grows about 6 ins. high, and has fragrant white flowers in summer; arenaria, a native of the seaside, is a variety of it.

Pyrus (pȳ-rus, from *pirus*, Pliny's name. Ord. Rosaceae).—A large and most important genus, including, as it does, those popular fruits the Apple and Pear (*see* Fruit). The Apple is P. Malus, the Pear P. communis. Several of the Pyruses are grown as ornamental trees for lawns and shrubberies; among these may be mentioned Aria, with white flowers in spring, the white Beam Tree, several varieties; Aucuparia, the Mountain Ash or Rowan, so much admired for its red fruits in autumn, several varieties, including one with pendulous branches and one with yellow fruit; floribunda, a free-blooming tree with rosy flowers in spring; Japonica (syn. Cydonia japonica), good for walls, large scarlet flowers in spring; Maulei, scarlet flowers and yellow fruits; sorbus, creamy flowers and red fruits, the Service Tree; and spectabilis, light red flowers in spring (*Botanical Magazine*, t. 267). P. baccata is the Siberian Crab, and P. Cydonia the Quince. All the Pyruses thrive in well-drained loamy soil; as a class they do not care for stiff, damp soil.

Quaking Grass.—*See* Briza.

Quassia.—Quassia chips, the product of Picraena excelsa, form a useful insecticide; if a handful are soaked in a gallon of cold water for a few hours they make a " bitter " which destroys aphides; or they may be boiled with soft soap, ½ lb. of each to 10 gallons of water.

Quercus, Oak (quēr-cus, from *quer* (Celtic), fine, and *cuez*, tree. Ord. Cupuliferae).—The noblest of our forest trees, growing splendid timber. The common British Oak is Q. Robur, and there are two forms, one with stalked and the other with stalkless acorn cups; the former, called pedunculata, is classed as a separate species by some botanists, and there are several good garden varieties of it, notably fastigiata, columnar; heterophylla, much-divided leaves; and pendula, drooping. There are also several varieties of the stalkless form, sessiliflora. Q. cerris, the Turkey Oak, is a popular tree, and has several forms, such as laciniata, much cut; Lucombeana, which holds its leaves very late; and variegata. Q. Ilex is the Holly, Holm, or Evergreen Oak, and it also has several varieties. Q. Mirbeckii is a handsome Oak with large toothed leaves. Q. coccinea Knap Hill Scarlet is one of the best garden Oaks, as its leaves colour richly and hang right through the autumn. Q. suber is the Cork Oak; its bark is the cork of commerce.

Quick.—Young plants of Crataegus Oxyacantha are called Quick when grown for hedges. *See* Hedge.

Quince (Pyrus Cydonia or Cydonia vulgaris).—*See* Fruit.

Raceme.—A cluster of flowers in which each flower, on its own stalk, grows on a central stalk.

Radish, Raphanus sativus (rāph-anus, from *ra*, quick, and *phainomai*, to appear, in reference to the rapid germination. Ord. Cruciferae).—*See* Kitchen Garden.

Ragged Robin, Lychnis Flos-cuculi.

Rake.—Iron rakes of various sizes are useful in reducing lumpy soil to a fine state suitable for sowing, and removing stones. A 10-in. is a useful size. Rakes should be mounted on Ash handles. A wooden rake with a 2-ft. head is useful for raking up leaves in autumn.

Ramondia (ramōnd-ia, after M. Ramond. Ord. Gesneraceae).—Pretty hardy perennial alpines, suitable for the rockery or selected nooks in the border. Pyrenaica, which grows about 6 ins. high and bears violet flowers in summer, is the best known (*see* the *Botanical Magazine*, t. 236); there is a white variety and also a dark one called purpurea. Serbica Nathaliae, with violet flowers, is a pretty variety. They like peat and loam in equal parts, with grit. Propagation is by seed in a greenhouse or frame in spring, or by division of old, well-established plants.

Rampion.—*See* Kitchen Garden.

Ranunculus, Crowfoot (ranūn-culus, from *rana*, a frog, because of their love of moist places. Ord. Ranunculaceae).—A large genus, varying greatly in habit and duration. Acris is the common Butter-

cup. Bulbosus is the Crowfoot, a troublesome garden weed with great tenacity of life, best extirpated by uprooting it while the soil is moist. Ficaria is the Lesser Celandine. The following are good garden species and varieties: aconitifolius plenus (Fair Maids of France), double white flowers in late spring, height about 18 ins.; amplexicaulis, white, spring, 9 ins. (*Botanical Magazine*, t. 266); Lyalli, white, spring, 2 to 3 ft. Asiaticus has given us the florists' Ranunculus. *See* Bulbs.

Rape (Brassica Napus).—Often sown to accompany Cress as a substitute for Mustard, and may be treated like the latter. Rape dust, the refuse of the seed, may be dressed into ground infested with wireworm.

Raphanus.—*See* Radish and Kitchen Garden.

Raffia or **Raphia.**—A cheap, strong, and flexible tying material, sold by florists; it is prepared from the hothouse palm, Raphia pedunculata.

Raspberry (Rubus Idaeus. Ord. Rosaceae).—*See* Fruit.

Raspberry-Blackberry.—A cross between the two fruits named. Culture as for Blackberry. *See* Fruit.

Rat's-tail Cactus, Cereus flagelliformis.

Red Cedar, Juniperus Virginiana.

Red Gum, Eucalyptus resinifera.

Red Spider.—Tetranychus telarius is one of the most troublesome of plant enemies, attacking both indoor and outdoor crops. It is really a sucking mite, not a true spider, although it spins a web on the under side of the leaves. When the leaves of Grape Vines, Peaches, Cucumbers, Scarlet Runners, and many other plants which might be named turn bronzy or yellow before the natural period of decay, red spider may be suspected. A dry atmosphere encourages it, a moist one is inimical to it. Frequent syringing is a preventive. In case of emergency, syringe with hot water in which soft soap at the rate of 1 lb. per gallon and sulphur 1 handful per gallon have been stirred; or dust with flowers of sulphur.

Rehmannia (rehmān-nia, after Dr. Rehmann. Ord. Scrophularineae).—Handsome herbaceous perennials, nearly hardy, but best grown in a cool house. They are not particular as to soil, and are propagated by cuttings in spring.

Renanthera (renanthē-ra, from *ren*, a kidney, and *anthera*, an anther, in allusion to the form of the anther. Ord. Orchidaceae).—A small genus of Orchids. Coccinea grows 4 to 5 ft. high, has red flowers, and looks well trained against a fern stump in a hothouse, also in a basket (*see* the *Botanical Magazine*, tt. 2997, 2998). Imschootiana has red and yellow flowers, and is also a good basket plant. They thrive in peat and Sphagnum moss, with sand and charcoal, and may be increased by cuttings in a propagating case.

Reseda, Mignonette (resē-da, from *resedo*, to calm, on account of soothing qualities being ascribed to it. Ord. Resedaceae).—*See* Mignonette and Annuals.

Rest Harrow.—*See* Ononis.

Retinospora or **Retinispora** (retinōs-pora, from *retine*, resin, and *sporos*, seed. Ord. Coniferae).—Handsome small Conifers, resembling Cupressus, and amenable to the same culture, in fact they are classed with the Cypresses by modern botanists. Erecta, ericoides, filifera, leptoclada, lycopodioides, obtusa, o. densa aurea, o. alba spica, pisifera, p. aurea, plumosa, p. aurea, p. argentea, squarrosa, and other species and varieties are offered by nurserymen under the name of Retinospora. Propagate by cuttings.



PROPAGATING RETINOSPORAS BY CUTTINGS IN AUTUMN.

1. Base. 2. Side-shoots removed. 3. Depth of insertion.

Rhamnus, Buckthorn (rhām-nus, from the Celtic *rham*. Ord. Rhamneae).—A large genus, of which only a few species and varieties need be considered. Alaternus, which grows 15 to 20 ft. high, and has green flowers in spring, is the best known; angustifolius, a. variegatus and aureus are varieties of it. Catharticus, 6 to 8 ft., has green flowers in summer, followed by black fruit. Frangula (syn. latifolius), the Black Dogwood, also has black fruit. Libanoticus colours well in autumn. They are all hardy, and not particular as to soil. Propagation is by seed and layers.

Rhapis (rhā-pis, from *rhapis*, a needle. Ord. Palmae).—Flabelliformis is a useful fan-leaved palm, suitable for rooms and corridors; there is a variegated-leaved variety. For culture, *see* Palms.

Rheum, Rhubarb (rhē-um, from *Rha*, the river near which the plant was found. Ord. Polygonaceae).—Some of the Rheums are useful for prominent positions in the wild garden, as the leaves are broad and massive. Palmatum and its variety purpureum are particularly good. They are hardy, and thrive in ordinary soil. Propagation is by division in spring. Rhaponticum is the common Rhubarb. *See* Kitchen Garden.

Rhipsalis, Mistletoe Cactus (rhīp-salis, from *rhips*, a Willow branch, on account of the flexibility. Ord. Cacteae).—*See* Cactus.

Rhodanthe (rhodān-the, from *rhodon*, a rose, and *anthos*, a flower. Ord. Compositae).—Pretty half-hardy annual everlastings. Manglesi, with rosy flowers in summer, grows about a foot high. Botanists now call it Helipterum Manglesii. For culture, *see* Annuals—Half-hardy.

Rhodochiton volubile (rhodochī-ton, from *rhodo*, red, and *chiton*, a cloak, in allusion to the calyx. Ord. Scrophularineae).—A handsome greenhouse climber, with red flowers in early summer (syn. Lophospermum). Loam, with sand and a third of leaf soil, suits it. Propagation is by seeds in a greenhouse in spring, or by cuttings in sandy soil under a bell-glass in August (*see* the *Botanical Magazine*, t. 3367).

Rhododendron (rhododēn-dron, from *rhodon*, a rose, and *dendron*, a tree. Ord. Ericaceae).—*See* Flower Garden—Trees and shrubs.

Rhubarb.—*See* Rheum and Kitchen Garden.

Rhus, Sumach (rhūs, from *rhudd*, red, in allusion to the fruit. Ord. Anacardiaceae).—A useful and singular genus. Cotinus, a hardy shrub 6 to 7 ft. high, with light purple flowers in early summer, is the popular Snake Plant; the variety atropurpurea has dark leaves, and pendula is of drooping habit. Toxicodendron is the Poison Ivy, a hardy climber with greenish-yellow flowers in early summer, contact with whose leaves causes painful sores on the skin (*see* the *Botanical Magazine*, t. 1806). Typhina, a hardy tree with greenish-yellow flowers in early summer, is the Stag's-horn Sumach. They will grow in almost any soil, and are propagated by cuttings and layers.

Ribbon Fern.—*See* Pteris serrulata.

Ribes, Currant, Gooseberry (rī-bes, from the Arabic. Ord. Saxifrageae).—A useful genus, both for the flower and the fruit gardens. Grossularia is the Gooseberry, nigrum the Black Currant, and rubrum the Red Currant; album, the White Currant, is a variety of the latter (*see* Fruit). Of the ornamental species, aureum, with yellow flowers followed by yellow fruit (*Botanical Register*, t. 125); and sanguineum, with rosy flowers in spring (*Bot. Reg.*, t. 349), are the most important. There are several varieties of both. They will grow in almost any soil, and are among the earliest of shrubs to grow. Sanguineum has a very strong Currant smell. Propagation is by cuttings in summer.

Richardia, Arum Lily (richār-dia, after M. Richard. Ord. Aroideae).—Africana (syn. aethiopica—*Botanical Magazine*, t. 832) is the familiar Arum Lily (*see* Bulbs). There are several varieties, of which Godfrey's, although small, is one of the best, as it is such a free bloomer. Elliottiana and Pentlandii have yeliow flowers. They are beautiful plants for the greenhouse.

Ricinus, Castor-oil Plant (rīc-inus, from *ricinus*, a tick, in reference to the seed. Ord. Euphorbiaceae).—Handsome foliage plants, used in sub-tropical gardening for their large, handsome leaves. They are all varieties of communis (*see* the *Botanical Magazine*, t. 2209). Gibsoni, with purplish leaves; and G. atrosanguineus, with crimson leaves, are two of the best. Castor oil is obtained from the seed of the species. They are best treated as half-hardy annuals (*see* Annuals), and like a deep, fertile soil.

Ridging.—The process of throwing up soil in parallel ridges in autumn or winter in order to let frost act on it.

Ringing.—An old garden practice, consisting in removing a ring of bark from a branch. It is done with plants to be layered before pegging the branches into the soil, and also with fruit trees just before the blossom opens to check the sap and promote fruitfulness.

Rivina (rivī-na, after Herr Rivinus. Ord. Phytolaccaceae).—Humilis is a handsome hothouse evergreen, growing about 2 ft. high,

with white flowers in early summer, followed by red berries, which hang a long time if the plants are kept in a cool, airy structure. Loam, with sand and a little leaf mould, suits them. Propagation is by seeds in heat in spring, and by cuttings. *See* the *Botanical Magazine*, t. 1781.

Robinia, Locust Tree (robīn-ia, after M. Robin. Ord. Leguminoseae).—Handsome hardy trees and shrubs, with pretty pinnate leaves and Pea-like flowers in bunches. Hispida, the Rose Acacia, is a beautiful tree 5 to 6 ft. high, with rosy flowers in spring (*see* the *Botanical Magazine*, t. 311); and inermis, which is a spineless variety of it, is still better. Neo-mexicana makes a handsome tree 15 to 30 ft. high, with rosy flowers in autumn. Pseudacacia, the False or Bastard Acacia, is the common Locust; it has white flowers in spring, and is a good street tree; angustifolia, aurea, Bessoniana, and robusta Vignei are varieties of it. The Robinias thrive in most soils, if not stiff and damp. Propagation is by seeds and grafting, but is best done in the nurseries.

Rochea (rō-chea, after M. La Roche. Ord. Crassulaceae).—Handsome evergreen succulents, allied to Crassulas, and grown in the same way. Coccinea, 1 ft. high, with scarlet flowers in summer; falcata (syn. Crassula falcata); and jasminea, 9 ins., with white flowers in spring, are the principal species.

Rock Broom.—*See* Genista.

Rockery.—*See* Flower Garden.

Rocket.—*See* Hesperis.

Rocket Candytuft, Iberis coronaria.

Rock Jasmine.—*See* Androsace.

Rock Rose.—*See* Cistus.

Rodgersia (rodgēr-sia, after Admiral Rodgers. Ord. Saxifrageae).—A small genus of hardy herbaceous plants, only one of which, podophylla, which grows 2 to 3 ft. high, and has small yellowish flowers in summer, is grown to any extent. It forms fleshy underground stems. It likes a moist, peaty spot. Propagation is by division in spring. *See* the *Botanical Magazine*, t. 6691.

Roller.—A roller is almost indispensable in a garden where there are gravel paths and turf. Both benefit greatly by its use after rain. Water-ballast rollers have come into use, but are not superior. An 18-in. roller will suffice for small gardens.

Romneya Coulteri, Tree Poppy (rōm-neya, after Dr. Romney Robinson. Ord. Papaveraceae).—A beautiful small Californian tree, growing 3 to 6 ft. high, and with large white flowers in summer. It likes a well-drained loamy soil and a sheltered spot where it will not be worried by strong winds. Propagation is by seeds sown in a greenhouse or heated frame in spring. R. trichocalyx is very similar to Coulteri.

Rondeletia (rondelē-tia, after M. Rondelet. Ord. Rubiaceae).—A small genus of hothouse evergreens, only one of which, odorata

(syn. speciosa), which grows 3 to 4 ft. high, and bears fragrant scarlet flowers in late summer, is much grown. It likes equal parts of peat and loam, with sand, and may be propagated by cuttings in a warm house under a bell-glass in summer. Cut hard back after flowering.

Room Plants.—With care in watering (*see* Watering), and ventilating in such a way as to provide fresh air without a cutting draught, many plants may be grown successfully in rooms (*see* Aralia, Aspidistra, Ferns, Ficus (India-rubber Plant), and palms among foliage plants; and Chrysanthemums, Cinerarias, Clivias, Cytisus, Francoa ramosa, Fuchsias, Zonal Geraniums, Primulas, and various bulbs among flowering plants). The fear of injury from plants in sick-rooms is not well based, but such apartments should always be well ventilated, both for the benefit of patient and plant. Strong-smelling flowers should be avoided. Naked gas burners are bad for plants, but where incandescent burners are used the injury is very small. Sheets of newspaper may be spread over the plants on cold nights.



A Pillar Rose with the straggling shoots shortened.

Rosa, Rose (rōse, from the Celtic *rhod*, red. Ord. Rosaceae).—An immense genus, giving as it does the beautiful Hardy Perpetual, Tea, Hybrid Tea, and other Roses of our flower beds, the climbers we use for walls, arbours, pillars, and pergolas, and a considerable number of beautiful species. It may be of interest to refer to a few of the species which are grown in gardens. Banksiae is the white Banksian Rose (*see* the *Botanical Magazine*, t. 1954); there is a yellow form, lutea; these are pretty wall Roses, which must only be pruned to the extent of thinning out some of the oldest wood, as they flower on shoots of two years old or more. Bracteata (*Bot. Mag.*, t. 1377) is the Macartney Rose, a dwarf species with white flowers. Canina is the Dog Rose of the hedges. Centifolia is the Cabbage Rose, of which there are many varieties, including muscosa, the moss Rose; there are several garden forms of the latter. Damascena is the Damask Rose, which is certainly one of the parents of our modern H.P.s; the variety versicolor has red and white flowers, and is called Gloria Mundi. Gallica provincialis is the Provence Rose. Indica is the China or Monthly Rose, and its variety odorata is one of the parents of our modern Tea Roses. Sinica (syn. laevigata) (*Bot. Mag.*, t. 2847) is the white Cherokee Rose. Lutea, a dwarf yellow species, is the Austrian Brier (*Bot. Mag.*, 363). Moschata is the Musk Rose. Multiflora (syn. polyantha) is the parent of many of our modern climbing Roses. Repens (syn. arvensis) capreolata is the



Rose Cuttings inserted.

Ayrshire Rose. Rubiginosa is the Sweet-brier. Rugosa is the Japanese Rose. Sempervirens is the Evergreen Rose. Wichuraiana (syn. Luciae) is one of the parents of many modern beautiful climbers, such as Dorothy Perkins, Lady Gay, and Alberic Barbier.

Rose gardens.—The flower garden must have Roses, unless it is so near a town that the Queen of Flowers refuses to thrive. Owners of large places may select a site, and form a set of Rose beds. It is a nice idea to plant a Yew hedge round the site, clipped to a formal shape, as it makes a splendid background for Roses, and has a quaint, old-world appearance. At each opening set an arch. Each bed may be planted with a separate variety and special sorts should be chosen. The following are good bedding Roses:—

Baby Dorothy	Grüss an Teplitz
Betty	Hugh Dickson
Caroline Testout	La France
Corallina	Madame Abel Chatenay
Edu Meyer	Mrs. John Laing
Frau Karl Druschki	Ulrich Brunner

Set the plants 2 ft. apart.

The following will succeed on arches and pillars:—

Alberic Barbier	Lady Godiva
Blush Rambler	Leuchtstern
Carmine Pillar	Mrs. F. W. Flight
Coquina	Philadelphia Rambler
Dorothy Perkins	White Dorothy

All grow vigorously and bloom profusely. It is not every Rose lover who is able to lay out a complete Rose garden; but plenty can plant a selection of Roses in a bed or border. In such cases they may prefer a larger selection of varieties, and the following can be recommended with confidence:—

Hybrid Perpetuals.	*Hybrid Tea.*
Chas. Lefebvre	Betty
Earl of Dufferin	Caroline Testout
Frau Karl Druschki	Dean Hole
Hugh Dickson	Earl of Warwick
Mrs. John Laing	Ecarlate
Ulrich Brunner	Edu Meyer
Tea-scented.	General MacArthur
Catherine Mermet	Grace Darling
Comtesse de Saxe	Lady Ashtown
Corallina	La France
G. Nabonnand	Le Progrès
Lady Roberts	La Tosca
Mrs. Dudley Cross	Madame Abel Chatenay
Peace	Madame Mélanie Soupert
Souvenir de Pierre Notting	Madame Hector Leuillot
White Maman Cochet	Rayon d'Or

Planting Roses.—Most rosarians plant in November, and those who can get their ground ready then should follow the example of the experts. They may, however, plant up to the end of March. The most substantial soil of the garden should be given to the Roses, for they love ground with plenty of body about it. One finds that the annual growth is much stronger in heavy than in light soil, and without abundant annual growth it is impossible to get the best of flowers. Manure helps the light soil, and so does deep working (*see* Bastard trenching under Kitchen Garden); still, a heavy loam or friable clay is desirable. The roots should not be buried deeply, but the soil should be trodden firmly round them.

Pruning Roses.—It is a good rule to prune all the varieties hard in spring after planting, as it gives them a good start, but afterwards the pruning should be regulated by the amount of annual growth. A variety that is so naturally vigorous and well suited by the soil as to make shoots 3 or 4 ft. long in a season need not be shortened much at the annual pruning, the best time for which is the end of March. Weak growers may be pruned to within 3 or 4 buds of the base. Most of the rambler Roses are best pruned late in summer—say September—when as many of the old canes as can be spared should be cut out. If there are plenty of strong young canes springing up from the base, all the old wood may go; but where basal canes are few it may be more desirable to shorten old canes to the young wood on them than to remove them altogether. The point is that there should be a nice lot of young wood to get good bloom the following year. If this is tied up the arches in September and exposed to the sun, it gets well ripened and flowers well. *See* page 274.

Wall Roses.—The best of the pillar and arch Roses are not suitable for walls, but the following are good:—

Alister Stella Gray	Gloire de Dijon
Bardou Job	Madame Alfred Carrière
Cheshunt Hybrid	Wm. Allen Richardson

They may be pruned by thinning out old wood and nailing in new to take its place. This may be done in late summer.

Standard Roses.—A standard Rose is one that is budded on to a straight Brier stem in summer, the Briers being bought or taken from the hedgerows the previous November and planted at once. But such standards may, of course, be bought from the nurseries, the same as dwarfs and climbers. Standards are not in general favour, but they are useful for special positions. Dorothy Perkins makes a beautiful standard, and when planted where it has plenty of room it makes a lovely specimen, with its long, flower-laden shoots drooping in profusion around the stem. The bare stem is a drawback to standards, and where many are planted it is well to carpet the ground with Violas, to take off the bareness.

Budding Roses.—An amateur cannot bud Roses properly without practice, and the best way of learning is to ask to assist a rosarian with his budding in the summer. The expert will show how the bud is sliced out in the shape of a long, narrow shield, how the leaf is cropped in to a stump, how the pith is picked out without tearing

away the growing germ, how the Brier is slit to receive it, how it is slid in, and how it is tied. It is an interesting little art, well worth learning. Cuttings may be struck in September; *see* page 275.

Mildew on Roses.—Both dwarf and climbing Roses are apt to be disfigured by mildew, although it does not often attack the shiny-leaved varieties. It should be checked directly the white patches show on the leaves by dusting on flowers of sulphur through a small pair of bellows, or by syringing with fresh liver of sulphur (sulphide of potassium) dissolved in water at the rate of half an ounce per gallon.

Rose Acacia.—*See* Robinia hispida.

Rose Bay.—*See* Epilobium angustifolium.

Rose Campion.—*See* Lychnis.

Rosemary, Rosmarinus officinalis (rosmarī-nus. Ord. Labiatae).—The leaves of Rosemary contain an essential oil, which is used by makers of perfumes and hair washes. It is a shrub growing 3 to 4 ft. high, and thriving in friable loamy soil. Propagation is by seeds in spring, also by cuttings in spring and layers in summer.

Rose of Heaven, Lychnis coeli-Rosa.

Rose of the World, Camellia Japonica.

Rotation of Crops.—*See* Kitchen Garden.

Rowan, Pyrus Aucuparia (Mountain Ash).

Royal Bay, Laurus nobilis.

Royal Fern, Osmunda regalis.

Rubus, Bramble (rū-bus, from *rub*, red, in allusion to the fruit. Ord. Rosaceae).—Deciduous shrubs and herbaceous plants, in some cases of coarse, rampant habit, as in the Blackberry. Several are well worth growing in the flower garden. Arcticus, herbaceous, which grows only a few inches high and has pink flowers in early summer, is worth growing on the rockery (*see* the *Botanical Magazine*, t. 132); there is a fruiting form of it called secundus. Biflorus, a tall species with white flowers in May (*Bot. Mag.*, t. 4678), has white stems. Chamaemorus, herbaceous, 6 to 9 ins. high, white flowers in summer, is the Cloudberry. Deliciosus is a beautiful shrub, with large white flowers in May. It grows 5 to 6 ft. high, and is spineless; the fruit is edible. Idaeus is the Raspberry (*see* Fruit). Laciniatus is the Parsley-leaved Blackberry (*see* Fruit). Phoenicolasius, with pink flowers followed by red fruit, which makes a nice preserve, is the Wineberry. Rosaefolius coronarius (single form) is the Strawberry-Raspberry (*see* Fruit). The Rubuses like a deep, rich, moist soil. The shrubs may be propagated by layering the tips of the canes, the herbaceous species by division.

Rudbeckia, Cone Flower (rudbēck-ia, after O. Rudbeck. Ord. Compositae).—The most useful species are hardy herbaceous plants with composite flowers, the centres of which are raised and the ray florets drooping. Grandiflora, yellow and purple, late summer, 3 to 4 ft.; laciniata, yellow and green, summer, 4 to 6 ft.; l. Golden

Glow, double yellow; and speciosa (syn. Neumannii or Newmannii), yellow and purple, summer, 3 ft., are the best. Ordinary soil. Propagation by division or seed in spring.

Rue, Ruta graveolens (rū-ta. Ord. Rutaceae).—*See* Kitchen Garden—Herbs.

Ruscus, Butcher's Broom, Box Holly (rūs-cus, from *bruscus*, which derives from the Celtic *beus*, box, and *kelem*, holly. Ord. Liliaceae).—Useful shrubs that will thrive as undergrowth among larger shrubs and trees. They have flattened branches and green flowers. The sexes are on different plants, and to have berries it is necessary to plant both kinds. Aculeatus (syn. flexuosus), which grows about 2 ft. high, is the best. Racemosus (syn. Danaea Laurus) is the Alexandrian Laurel. Ordinary soil. Propagation is by seeds or division.

Rush, Flowering, Butomus umbellatus.

Sabal, Fan Palm (sā-bal. Ord. Palmae).—Large palms, the most popular of which is Blackburniana, which may grow 20 ft. high and produce leaves 3 ft. across, much divided at the margins, the Fan or Thatch Palm. It thrives with the ordinary treatment of this class. *See* Palms.

Saccolabium (saccolā-bium, from *saccus*, a bag, and *labium*, a lip, in reference to the form of the labellum. Ord. Orchidaceae).—Pretty Orchids, with small fragrant flowers, borne in abundance on long racemes. They need a hothouse, where they should have a light position and a great deal of moisture. A night temperature of 70° to 80° will suit them while growing; from October to March 60° to 65° will suffice. They should be grown in suspended teak baskets, and may be dealt with when they start growing. A mixture of crocks, charcoal, and fibrous peat, surfaced with Sphagnum, suits. They will not need much water in winter, but should not be dried off. Bellinum, various colours, spring; giganteum, purple and white, winter (*Botanical Magazine*, t. 5635); and violaceum, white and mauve, winter (*Botanical Register*, t. 30), are the best species. There are several varieties.

Sacred Bean, Nelumbium speciosum.

Saddle Tree, Liriodendron tulipifera.

Saffron, Crocus sativus.

Saffron, Meadow, Colchicum.

Sage (Salvia officinalis).—*See* Kitchen Garden—Herbs.

Sagittaria (Arrowhead).—*See* Flower Garden—Aquatics.

Sainfoin (Onobrychis sativa).—A fodder plant.

St. Bernard's Lily, Anthericum Liliago.

St. Bruno's Lily, Anthericum (Paradisea) Liliastrum.

St. Dabeoc's Heath.—*See* Daboëcia polifolia.

St. John's Wort.—*See* Hypericum.

Saintpaulia ionantha (saintpāūl-ia, after Herr Saintpaul. Ord. Gesneraceae).—A pretty little warm-house plant, growing only about 4 ins. high, and producing violet flowers late in summer. Loam and leaf mould in equal parts, with sand, make a good compost. Leaf cuttings root readily if inserted in moist sand and cocoa-nut fibre refuse and put into a warm case; when rooted they may be potted singly and subsequently transferred to 5-in. Leaf cuttings may be taken at different seasons to insure successional flowering. There are several varieties, differing in tint.

Salads.—*See* Kitchen Garden.

Salisburia.—*See* Ginkgo.

Salix, Willow (sā-lix, from *sal* (Celtic), near, and *lis*, water. Ord. Salicineae).—Hardy deciduous trees, of rapid growth in moist places, and therefore suitable for planting at the waterside. Propagation is by cuttings and seeds. To get good drooping plants the pendulous forms may be grafted on tall stems. Alba, the White Willow, has several varieties, of which vitellina and v. pendula are good. Caprea is the common Sallow or Goat Willow; the drooping variety of this, pendula, is the Kilmarnock Willow. Elegantissima has drooping branches.

Sallow.—*See* Salix.

Salpiglossis (salpiglŏss-is, from *salpinx*, a tube, and *glossa*, a tongue, in allusion to the style. Ord. Solanaceae).—Beautiful plants, the most valuable species of which is sinuata, from which have been derived the splendid annuals offered by seedsmen. The flowers are large and the colours are rich. The habit is loose and graceful. They are best treated as half-hardy annuals (*see* Annuals), and may be planted in beds or borders in May or June. They are also good for pots; in this case, flower them in 5-in., using a compost of loam and decayed manure, with sand. Linearis, purple, August, 1 ft. (syn. Petunia intermedia), is a half-hardy perennial.

Salsafy or **Salsify** (Tragopogon porrifolium. Ord. Compositae).—*See* Kitchen Garden.

Salvia (sāl-via, from *salvo*, to save, in allusion to medicinal qualities. Ord. Labiatae).—The Salvias are among the most brilliant of flowers, and are particularly useful for giving bright masses of bloom in winter. The best species for this purpose is splendens (*Botanical Register*, t. 687), herbaceous, of which several fine varieties are now available, such as Bruantii, compacta, grandiflora, and Silver Spot. They bloom most profusely. Salvia patens, an evergreen, gives us a lovely shade of rich, shining Gentian-blue (*Botanical Magazine*, t. 3808). This is a summer bloomer. It is so nearly hardy that it may be



PROPAGATING SALVIA SPLENDENS BY CUTTINGS IN LATE SUMMER.

1. Drainage. 2. Soil.

used for outside beds in mild districts. In cold, exposed places it is best kept as a pot plant. While these two species are the best of the Salvias, others must not be overlooked; azurea, blue, autumn and winter bloomer, 5 to 7 ft., requires greenhouse culture; Heeri, scarlet, winter, greenhouse, 3 ft., an evergreen; and involucrata Bethelli, crimson, summer, 4 ft., greenhouse, also evergreen, are all good. Officinalis is the common Sage (*see* Kitchen Garden—Herbs). Horminum, purple, early summer, 8 ins., is a hardy annual; Blue Beard is a good variety of it. Rutilans, red, winter, 3 ft., greenhouse, herbaceous, is good. There are hundreds of other species. Loam, with sand and a little decayed manure, suits the Salvias. They may be propagated by seed or cuttings in heat towards the end of winter. Those grown in pots should be repotted by stages till they get to 6-in., 8-in., or even larger pots. Splendens should be pinched occasionally to insure a compact habit.

Sambucus, Elder (sambū-cus, from *sambuke,* a musical instrument made of Elder-wood. Ord. Caprifoliaceae).—Several garden forms of Sambucus are much superior to the common Elder, which is a coarse, straggly plant, only interesting for a few weeks in early summer, except to those who like the wine made from the flowers and fruit. Nigra foliis aureis, the Golden Elder, is good. Racemosa, with white flowers in branched racemes, followed by red fruit, is very ornamental. There are several pretty varieties of it, notably laciniata, plumosa, p. aurea, and tenuifolia. The Elders thrive in ordinary soil, and the old wood should be pruned out. Propagation is by cuttings of mature shoots in late summer.

Sand.—Valuable for lightening composts and stimulating root action. Silver sand is good for surfacing the soil when sowing fine seeds or striking cuttings, but coarser sand, such as washed river or sea sand, is better for composts, as it is coarser and keeps the soil more open.

Sanguinaria canadensis, Bloodroot, Puccoon (sanguinā-ria, from *sanguis,* blood, in allusion to the red juice. Ord. Papaveraceae).—A useful herbaceous perennial, 6 ins. high, with white flowers in spring, before the leaves expand (*see* the *Botanical Magazine,* t. 162). Major (syn. grandiflora) is a larger-flowered form. They look well in clumps at the front of the border, or in the rock garden. Sandy peat should be provided. Propagation is by seeds in spring, or by division in autumn.

Santolina, Lavender Cotton (santolī-na, from *sanctus,* holy, and *linum,* flax. Ord. Compositae).—Scented sub-shrubs, with yellow flowers. The most popular is Chamaecyparissus incana, often grown simply as incana, which makes a pretty white carpet. They like a light, dry soil, and are propagated by cuttings in spring or autumn.

Sanvitalia procumbens (sanvitā-lia, after Señor Sanvitali. Ord. Compositae).—A pretty half-hardy annual of trailing habit, with yellow and purple flowers (*see* the *Botanical Register,* t. 707); there is a double variety. For culture, *see* Annuals.

Saponaria, Soapwort, Fuller's Herb (saponā-ria, from *sapo*, soap; the leaves of officinalis lather when rubbed. Ord. Caryophylleae).—A large genus of annuals and perennials, mostly hardy. A few are good garden plants, notably calabrica, a dwarf hardy annual with pink flowers, and its white variety alba; ocymoides, a hardy perennial trailer with purplish-rose flowers, the Rock Soapwort (*see Botanical Magazine*, t. 154); and officinalis, a hardy perennial growing about 3 ft. high, pink; the double variety flore pleno is good. They all bloom in summer. Calabrica may be sown outdoors in September to bloom in spring. Vaccaria, red, 18 ins., is a good annual (*Bot. Mag.*, t. 2290). Ordinary soil. Propagation is by seed (*see* Annuals) and division.

Saprophyte.—A plant that grows on decaying matter, animal or vegetable, like many fungi (*cf.* parasite, a plant that grows on living matter).

Sarracenia, Side-saddle Flower (sarracē-nia, after Dr. Sarrasin. Ord. Sarraceniaceae).—Singular plants, forming clusters of small pitchers. They are perennials, from North America, half hardy. Purpurea (*Botanical Magazine*, t. 849) is the nearest to complete hardiness, and is sometimes grown on the rockery, with a covering of Bracken in winter. It likes a cool, moist spot. Those who have a liking for the genus sometimes devote a small greenhouse to them in preference to mixing them with other plants, as they like a moist atmosphere. Fibrous peat, with charcoal and a fourth of chopped Sphagnum moss, suits. Propagation is by division in early spring in a close, moist, warm case. The plants must have abundance of water during the growing season. A temperature of 45° to 55° will suffice in winter. The following are a few of the best species: Drummondi (alba and rubra are good varieties), flava (atro-sanguinea, Catesbaei, and maxima are good varieties), purpurea, and rubra. Good hybrids are Chelsoni, Courtii, Stevensii, and Williamsii.

Sarsaparilla.—The root of Smilax species, used medicinally.

Satin Flower, Sisyrinchium.

Savory, Satureia (saturē-ia, from the Arabic *sattar*. Ord. Labiatae).—*See* Kitchen Garden—Herbs.

Savoy.—*See* Kitchen Garden.

Saxifraga, Rockfoil (saxĭf-raga, but commonly saxifrā-ga, from *saxum*, stone, and *frango*, to break—supposed use in bladder troubles. Ord. Saxifrageae).—A large and important genus of hardy alpine plants, the adequate description of which would require a volume in itself. The genus varies greatly, some species being moss-like in growth, others large, loose, and spreading. They are charming for the rock garden, and some may be used for edgings. S. Umbrosa, the well-known London Pride, is a case in point. No general hint as to soil may be given, as the species vary in their requirements. The mossy Saxifrages will thrive in ordinary garden soil provided it is not dry. The encrusted species like a limestone soil. The large-leaved Megasea section love a moist soil. Propagation is by seed,

sown in a greenhouse or frame in spring, or, if home-saved, as soon as ripe; by division, and by cuttings. Sarmentosa, the well-known Mother of Thousands (see *Botanical Magazine*, t. 92), is propagated by runners. The following are a few good Saxifrages: Of the large, fleshy-leaved Megasea section, cordifolia, pink, with its varieties purpurea and alba; ligulata, purple (*Bot. Mag.*, t. 3406); and Stracheyi, pink (*Bot. Mag.*, t. 5967), may be grown. All bloom in spring. Of the mossy section a few of the best are caespitosa, white, summer; Camposi (Wallacei), white, spring (*Bot. Mag.*, t. 6640); decipiens, white, spring; hypnoides, white, spring; muscoides, yellowish, spring, the varieties of this called atropurpurea and Rhei are good; and trifurcata, white, spring, variety ceratophylla is good (*Bot. Mag.*, t. 1651). Among the beautiful encrusted class will be found Aizoon, cream, red dots, early summer; cochlearis, white, early summer; Cotyledon, white, spring, and its splendid variety pyramidalis; crustata, white, dotted red, early summer; Hostii, white, spring; and longifolia, white, dotted red, early summer (*Bot. Mag.*, t. 5889). Pretty tufted Saxifrages are apiculata, yellow, spring; Boydi, yellow, spring; Burseriana, white, winter, and its larger variety major; Rocheliana, white, summer; sancta, yellow, late spring; and Valdensis, white, spring. Granulata, the white meadow Saxifrage, and its double variety flore pleno, must not be overlooked; nor must the pretty little oppositifolia, purple, spring, with its varieties, of which major is one of the most popular. In addition to these species and varieties there are a good many hybrids, so that the lover of Saxifrages has abundant material for study.

Scabiosa, Scabious (scabiō-sa, from *scabies*, the itch, in allusion to its value in soothing that trouble. Ord. Dipsaceae).—Pretty and fragrant flowers, best represented in gardens by the varieties of atropurpurea, an annual with dark crimson flowers in summer, growing 2 to 3 ft. high (*see* the *Botanical Magazine*, t. 247). The double forms of this popular plant are very handsome, and seed may be bought in separate colours or mixture. It may be sown out of doors in spring (*see* Annuals). Caucasica is a hardy perennial growing about a foot high, with large pale blue flowers, good for the rockery or border; there is a white variety, alba; it may be raised from seed or increased by division in spring. The Scabiouses will thrive in ordinary soil.

Scale.—There are many species of scales infesting various plants. The females attach themselves to the bark, suck out the juices, lose the power of movement, and lay eggs, which are protected by a horn-like substance. Two of the worst scales attack Apples and Pears. *See* Pear enemies under Fruit.

Scarlet Runner (Phaseolus multiflorus).—*See* Kitchen Garden.

Schizanthus, Butterfly Flower (schizān-thus, from *schizo*, to cut, and *anthos*, flower, in allusion to the fringed petals. Ord. Solanaceae).—Beautiful annuals, well adapted for pot culture, suitable for sowing in late spring to bloom in summer, and in late summer to bloom the following spring. They flower profusely, and the

colours are very bright. The foliage is much cut, and bright green in colour, so that it is ornamental in itself. The majority are half hardy, but pinnatus, purplish-lilac and yellow, summer blooming, 18 ins., high, is hardy, and may be sown outdoors if desired. There are several varieties of it. Papilionaceus, purple spotted, is popular. Grahami, lilac, 18 ins. (*Botanical Magazine*, t. 3044); retusus, rose and orange, with its variety albus, white; and Wisetonensis, various colours, are the best of the half-hardy species; the last is dwarfest and most compact. In growing for spring bloom get the plants established singly in small pots in autumn, and winter them on a greenhouse shelf.

Schizocodon soldanelloides (schizocō-don, from *schizo*, to cut, and *kodon*, a bell. Ord. Diapensiaceae).—A pretty hardy perennial, only growing 3 or 4 ins. high, with rosy, fringed flowers in early spring. It is a nice rockery plant, liking sandy peat in a shady spot, and propagated by seed or division.

Schizopetalon Walkeri (schizopēt-alon, from *schizo*, to cut, and *petalon*, a petal. Ord. Cruciferae).—A pretty hardy annual, growing about 9 ins. high, with white, fringed, fragrant flowers. For culture, *see* Annuals.

Schizostylis, Kaffir Lily, Winter Gladiolus (schizōs-tylis, from *schizo*, to cut, and *stylos*, a column. Ord. Irideae).—*See* Bulbs.

Sciadopitys verticillata, Umbrella Pine (sciadōp-itis, from *skias*, a parasol, and *pitys*, a Fir. Ord. Coniferae).—An interesting and ornamental tree with a spreading whorl of foliage, hardy if planted in a sheltered place. A loamy soil, lightened with leaf mould, is desirable. Propagation is by seed.

Scilla, Squill, Wild Hyacinth (scīll-a, from *skyllo*, to injure, the bulb being reputed poisonous. Ord. Liliaceae).—*See* Bulbs.

Scolopendrium, Hart's-tongue Fern (scolopēn-drium, from *scolopendra*, a centipede, in reference to the spore cases. Ord. Filices).—A large genus when considered as embracing the numerous varieties, but the number of species is few, and only vulgare, the common Hart's-tongue, is of real importance. The number of forms of this variable fern runs to hundreds, and they constitute quite an interesting study for fern lovers. Acrocladon, crispum, cristatum, fimbriatum, grandiceps, Kelwayi, marginatum, ramosum, and variegatum are a few good varieties; there are many sub-varieties. Leaf mould, with a third of loam and some pieces of sandstone, suits. Propagation is by spores (*see* Ferns), except in the case of some of the varieties of tufty habit, which may be divided when growth starts. Vulgare and its varieties are hardy, but many are well worthy of pot culture.

Scorzonera, Scorzonera hispanica (scorzonē-ra. Ord. Compositae).—*See* Kitchen Garden.

Scotch Primrose, Primula scotica.

Screw Pine.—*See* Pandanus.

Scrub Oak, Quercus Catesbaei.

Sea Buckthorn, Hippophae rhamnoides.

Seaforthia (seafōr-thia, after Lord Seaforth. Ord. Palmae).—

Handsome palms. S. elegans (syn. Archontophoenix Cunninghamii) is a graceful species. For culture, *see* Palms.

Sea Holly, Eryngium maritimum.

Seakale (Crambe maritima).—*See* Kitchen Garden.

Sea Lavender, Statice Limonium.

Seaweed.—This substance is good as manure, and may be used with advantage for Asparagus, Potatoes, and Turnips. It should be used while fresh.

Secateur.—Small hand-pruning shears, which, if kept well oiled and sharpened, are preferable to a pruning knife in many cases.

Sedum, Stonecrop (sē-dum, from *sedere,* to sit, in allusion to their habit of growth. Ord. Crassulaceae).—A large genus of succulent plants, useful because they will thrive in dry places and in poor soil; they may be put on dry rockeries and on walls; they like limestone. Propagation is by seeds, cuttings (dried before insertion), and division. The following are a few of the best: Acre, yellow, summer, 2 or 3 ins. high, has several varieties, such as elegans and aureum; Album, white, summer, grows about 6 ins. high; Caeruleum, blue, summer, 4 to 6 ins.; Lydium, pale pink or white, summer, about 3 ins. high; Sieboldi, pink, summer, about a foot; Spectabile, pink, late summer, about 18 ins. Others are acre and its varieties, glaucum, kamschaticum, Turkestanicum, virens and Rhodiola.

Selaginella (selaginēl-la, a diminutive of *Selago,* which comes from *sel* (Celtic), sight, and *jach,* beneficial—literally, good for the eyes. Ord. Selagineae).—A large genus of elegant plants, some of which are of trailing habit. They love moisture in summer, but not overhead, so that syringing should not be practised. The creeping sorts should be grown in pans, the upright ones in pans or pots. Loam and leaf mould in equal parts, with a good deal of sand, suit. Propagation is by cuttings of the main stems in spring and summer, or by layering. The following are a few of the best: Braunii, erect, 1 ft. to 18 ins.; Galeottei, 1 ft., good for a hanging basket; grandis, branching, should have a close case; Kraussiana (syns. denticulata and Lycopodium denticulatum), creeping; Martensii, branching; and uncinata, trailing.

Selenipedium.—A section of Cypripedium, only recognised by botanists.

Self.—A flower with only one colour. *See* Carnations, etc.

Sempervivum, Houseleek (sempervī-vum, from *sempervivo,* everliving. Ord. Crassulaceae).—A large genus of succulents which, like the Sedums, will thrive in poor, dry soil. The hardy kinds will grow on walls, roofs, and dry rockeries. They like lime. Propagation is by seeds in spring, or offsets. The following are a few of the principal kinds: arachnoideum, red, early summer, 4 ins. high, the Cobweb Houseleek (*see* the *Botanical Magazine,* t. 68); there are many varieties. Arenarium, yellow, summer, 6 ins. Glaucum, red, summer, 9 ins. Tabulaeformae and variegatum are grown for their foliage and used in carpet bedding. Tectorum, red, summer, 1 ft., is the common Houseleek; there are several varieties.

Senecio, Groundsel (senē-cio, from *senex*, an old man, in allusion to the bare receptacle. Ord. Compositae).—A large genus, with which modern botanists have now united Cineraria, although they are not supported by gardeners. The species are very variable in habit and duration. Doronicum is a yellow hardy perennial, 1 ft. high. Elegans (syn. Jacobaea elegans) is a half-hardy annual of which several colours are available. Macroglossus, the Cape Ivy, is a greenhouse evergreen climber, with pale yellow flowers in summer (*see* the *Botanical Magazine*, t. 6149). Pulcher is a hardy perennial, 1 ft. high, with purple flowers in autumn (*Bot. Mag.*, t. 5959). Macrophyllus is a hardy perennial with yellow flowers and large leaves, best in a sheltered place. They are not particular as to soil. The annuals are raised from seed in spring, the perennials from seed and by division.

Sensitive Fern, Onoclea sensibilis.

Sensitive Plant, Mimosa pudica.

Sequoia, Wellingtonia (sequōī-a, a native name. Ord. Coniferae).—Sequoia gigantea is the proper name, botanists tell us, of the magnificent Californian tree known as Wellingtonia gigantea, which has attained a height of over 100 yards and a girth of 10 in America. It does not attain to these extraordinary dimensions in Great Britain, but in good loamy soil, and uncrowded, becomes a fine tree. There are several varieties of it, such as argentea, silvery; aurea, yellow; and pendula, drooping. The other species is sempervirens, the Californian Redwood, which is of pyramidal habit; there are several varieties of this also. The species are propagated by seed, the varieties by cuttings or grafting.

Sericographis.—*See* Jacobinia.

Service Berry, Amelanchier.

Service Tree, Pyrus Sorbus.

Service Tree, Wild, Pyrus torminalis.

Setting.—To "set" fruits, such as Melons, is to transfer pollen from male to female flowers.

Shaddock, Citrus decumana.

Shading.—*See* Greenhouse.

Shallon, Gaultheria Shallon.

Shallot (Allium ascalonicum. Ord. Liliaceae).—*See* Kitchen Garden.

Shamrock.—The yellow Suckling, Trifolium minus, and the white Clover, Trifolium repens, both have supporters in the claims made for them as being the true Irish Shamrock. Oxalis Acetosella is also used, but less commonly.

Shanking.—*See* Fruit—Grapes.

Shears.—A pair of short-handled shears should be kept in gardens for clipping hedges, and a pair of long-handled, with short blades, for trimming grass verges. They should be kept sharpened and oiled.

Shepherd's Purse.—Capsella Bursa-pastoris, a troublesome weed, which must be kept under subjection in gardens.

Shifting.—Repotting is often spoken of as "shifting" by gardeners. *See* Potting.

Shield Fern.—*See* Aspidium.

Shirley Poppy.—*See* Papaver.

Shortia (shōrt-ia, after Dr. Short. Ord. Diapensiaceae).—A small genus of pretty hardy perennials, growing but a few inches high, and blooming in spring. They are good for shady parts of the rockery, where they thrive in sandy peat. Propagation is by offsets, which may be removed from strong plants in spring. Galacifolia has white and uniflora pale pink flowers.

Shrubbery, Shrubs.—*See* Flower Garden.

Siberian Crab, Pyrus baccata.

Sibthorpia (sibthōrp-ia, after Dr. Sibthorp. Ord. Scrophularineae).—A small genus, comprising one pretty plant in europaea, the Cornish Moneywort, which grows 6 to 8 ins. high, and has pink flowers in summer. Still prettier is the form variegata, which is best grown in a greenhouse or room, and looks well in a hanging basket. Loam and leaf soil in equal parts, with sand, suit. Propagation is by cuttings in a frame in spring or summer.

Side-saddle Flower.—*See* Sarracenia.

Silene, Catchfly (silē-ne, from *sialon*, saliva, from the glutinous secretion. Ord. Caryophylleae).—Pretty annual, biennial, or perennial herbaceous plants, the majority hardy and good for the rockery or for beds. The most popular is the hardy annual pendula and its variety compacta, which have pink flowers, and do well when sown in August for spring blooming. Acaulis, pink, early summer, 3 ins. high, the Cushion Pink or Moss Campion, is good, and has several varieties. Maritima flore pleno, double white, is a good hardy trailer. Schafta, deep red, summer, 6 ins., is also a good rock plant. Ordinary soil. Propagation is by seed, or by division in the case of the perennials.

Silk Vine, Periploca graeca.

Silphium, Compass Plant (sīl-phium, from *silphion*, a Greek name. Ord. Compositae).—Hardy perennials of little importance, but laciniatum, which grows 5 to 6 ft. high, and has yellow flowers in summer, is interesting from its supposed peculiarity of turning its leaves north and south. Ordinary soil suits. Propagation is by seed or division.

Silver Fir, Abies pectinata.

Silver Leaf.—*See* Plum enemies under Fruit.

Sinapis, Mustard (sinā-pis, from *nap* (Celtic). Ord. Cruciferae).—*See* Kitchen Garden.

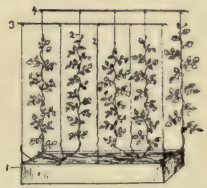
Sisyrinchium, Satin Flower (sisyrīn-chium, from *sys*, a pig, and *rynchos*, a snout, in reference to their being uprooted by wild pigs. Ord. Irideae).—Pretty hardy perennials, suitable for the rockery, or for culture in pots in a cool greenhouse. Grandiflorum, which has purple flowers in spring, and grows about a foot high, is the most important (*see* the *Botanical Magazine*, t. 3509). There is a white variety. Loam, with sand and a third of leaf mould, suits. Propagation is by seeds in spring or offsets.

Skimmia (skĭm-mia, from the Japanese *Skimmi*. Ord. Rutaceae). —Hardy evergreen shrubs, of which the principal species is japonica (*see* the *Botanical Magazine*, t. 4719); it produces white flowers in spring, followed by berries if both the male and female forms are planted, and grows 3 to 4 ft. high; there are several varieties, including the fragrant gratissima. Fortunei, with greenish-white flowers; and Laureola, yellow, Citron-scented, are also grown. Peat and loam suit. Propagation is by seeds, sown when ripe, and by cuttings in a warm house under a hand-light.

Slipperwort.—*See* Calceolaria.

Sloe, Prunus spinosa.

Slugs.—Gardeners have not yet satisfied themselves of the useful part played by the slug in the economy of Nature. Knowing it as a voracious feeder on young plants they have classed it as an enemy that must be rigorously repressed. But the slug takes a good deal of subduing. Nocturnal in habits, clever at finding hiding-places and covering up its tracks, it often ends triumphant. Slugs are more abundant on damp than on dry sites. They love moisture. But moisture in one form—lime-water—takes them at a disadvantage, and if any gardener who is much harassed by slugs would make a practice of putting a lump of fresh lime as big as a cocoa-nut in a pail of water, straining off the liquid a few hours afterwards, and watering with it at night, 2 or 3 evenings in succession, he would soon reduce them; or he could slack a little fresh lime, take the powder, and dust it about at night. A good method of trapping slugs is to put down small heaps of fresh brewers' grains near the plants in the evening, and examine them after dark. Growers of alpines should look under overhanging plants on their rockeries periodically, as slugs are apt to establish themselves in cool, moist, shady crevices, and make raids on choice plants. If plants in greenhouses or frames are found nibbled, a few of the pots in the neighbourhood should be lifted and examined. Slugs often choose the drainage hole of a flower-pot as a hiding-place.



How to train Smilax.

1. Box. 2. Strings. 3, 4. Bamboo rods.

Smilax (smī-lax, from *smile*, a scraper, in allusion to the prickly stems. Ord. Liliaceae). — The "Smilax" of gardens is Asparagus medeoloides (*see* Asparagus), the Smilax genus of botanists are climbing shrubs. The common Smilax is generally trained up strings, and is planted out in a border or grown in boxes.

Smoke Wood, Clematis Vitalba.

Snails.—*See* Slugs.

Snake Millipede.—*See* Millipede.

Snake Plant, Rhus Cotinus.

Snake's Head, Fritillaria Meleagris and Iris tuberosa.

Snapdragon.—*See* Antirrhinum.

Sneezewort, Achillea Ptarmica.

Snowball Tree, Viburnum opulus sterile.

Snowdrop.—*See* Bulbs and Galanthus.

Snowdrop Tree, Halesia tetraptera.

Snowdrop Windflower, Anemone sylvestris.

Snowflake.—*See* Bulbs and Leucojum.

Snow Glory (Chionodoxa).—*See* Bulbs.

Snow-in-summer.—*See* Cerastium.

Snow-on-the-mountain.—*See* Arabis.

Soapwort.—*See* Saponaria.

Sobralia (sobrā-lia, after Señor Sobral. Ord. Orchidaceae).—Terrestrial Orchids of tall growth, easy to manage in a hothouse. They have thick roots, but no pseudo-bulbs. Loam and fibrous peat in equal parts, with charcoal and sand, form a suitable compost. Propagation is by division when growth starts. They will require water all the year round, but more in summer than in winter. Macrantha, purple, white, and yellow, 4 to 6 ft., flowering in summer, is the best species; there are several varieties of it, of which albida, Schröder's variety, and splendens may be named. There are also several hybrids.

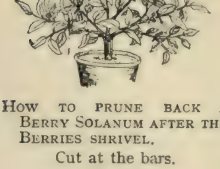
Soil.—The soil we deal with in our gardens is the detritus of rocks mingled with particles of decayed vegetation, such as leaves. It varies greatly, in some districts being heavy and tenacious, in others light and loose. We have stiff, dark soils which we call clay, tenacious yellow soil called marl, sand and stones mixed under the name of gravel, reddish or brownish fibrous soil called loam, and white, soft rock called chalk. It would hardly be within our scope to describe at length the geographical changes which have disintegrated rocks and accumulated gritty particles; our business is to deal with soil as we find it. The proper management of the soil, both with respect to tillage and manuring, is vital to success in gardening. It is important to raise the heat of the soil, and the first step to secure that end is drainage and aeration. In gardens above sea-level, and on ground with a natural fall for the water which comes from the clouds and soaks into the soil, there is natural drainage, especially if the soil be loam, gravel, chalk, or sand. If, however, the ground is so situated that there is no outlet, and is stiff, it is advisable to drain it artificially. This is effected by laying 2-in. earthenware pipes in trenches 3 ft. deep and 15 to 20 ft. apart, closer or wider according as the soil is very or moderately heavy. The pipes should converge on a main drain with an outlet at some selected spot. Aeration is facilitated by drainage, as stagnant moisture cannot lie near the surface of drained soil. It is carried further by crumbling the ground to the level of the drains, and this is effected by removing the top spit and breaking up the under spit, incorporating at the same time mortar rubbish, road scrapings, coal ashes, and any vegetable refuse available. Heavy, cold, damp soil which is treated in this way soon becomes warmer, drier, and more

fertile. Such ground in its natural untilled state is unsuitable for the principal fruits, and the crops of vegetables are late; in its ameliorated state it will grow good fruit and (given a reasonable amount of shelter) early vegetables. Trees, shrubs, Roses, and flowering plants generally thrive the better in heavy soil when it is drained and aerated. The reason is that more of the nitrifying bacteria which convert manure into plant food can live in the tilled than in the untilled soil. Those who are establishing gardens for market culture should give careful attention to the selection of ground. This is particularly necessary where fruit is to be planted. The best fruit lands are generally found within 50 miles of the sea, where the soil is loam. Neither very stiff nor very light soil is ideal. For vegetable culture shelter and a warm aspect are important, because they favour earliness, which means good prices. Those who are making gardens for pleasure need not be so particular.



A Berry Solanum
Making fresh growth after being cut back.

Solanum, Nightshade (solā-num, from *solor,* to comfort, in allusion to the narcotic influences. Ord. Solanaceæ).—A large genus, and one of outstanding importance, inasmuch as it includes the Potato, S. tuberosum (*see* Kitchen Garden). Hybridists have endeavoured to give the garden Potato improved disease-resisting powers by crossing with other species, such as S. Maglia and S. Commersoni, but hitherto without success. The latter is the so-called " swamp Potato; " it will thrive in moist places, but is of no value as a food crop. The genus Solanum includes several plants well worth growing for their ornamental appearance. One case in point is the " Winter Cherry," S. Capsicastrum, which carries a crop of bright red berries through the winter. This may be raised from seed or cuttings. If the former, sow in a frame or greenhouse in spring; if the latter, rest the old plants in spring, prune them back, water and syringe them, then take some of the young shoots which push and insert them in sandy soil under a bell-glass. The plants may be put outdoors in the summer and potted up into 5-in. about mid-September, using a compost of loam with a little decayed manure and sand. There is a sort with variegated leaves. Other ornamental Solanums are crispum, a hardy wall evergreen shrub with blue flowers in summer, followed by yellowish fruits; jasminoides, a greenhouse climber with blue and white flowers in summer, there is a variegated variety; Melongena, the Egg Plant (*see* Kitchen Garden); robustum, a greenhouse species with handsome foliage, suitable for planting in a sub-tropical garden in summer; and Wendlandii, a warm-house



How to prune back a Berry Solanum after the Berries shrivel.
Cut at the bars.

climbing shrub, with lilac flowers in summer. *See* the ***Botanical Magazine***, t. 6914.

Soldanella (soldanēl-la, a diminutive of *solidus*, a piece of money, referring to the form of the leaves. Ord. Primulaceae).—Pretty alpines, well worth growing on the rockery. The leaves are heart-shaped. The most popular species are alpina (syn. Clusii—*Botanical Magazine*, t. 2163) and pusilla, both of which grow about 3 ins. high and have drooping blue flowers in April. Pyrolaefolia is a variety of the former species; hybrida is a hybrid between the two. They like a compost of loam and peat, and should be top-dressed with leaf mould and grit every autumn. Propagation is by seeds in a frame in spring, and by division after flowering. They should have a cool, moist place in the rock garden. It is well to put a square of glass over alpina in autumn to throw off the winter rains.

Solidago, Golden Rod (solidā-go, from *solidare*, to unite, in allusion to the healing virtues. Ord. Compositae).—*See* Golden Rod.

Solomon's Seal.—*See* Polygonatum and Bulbs.

Soot.—A useful fertiliser for most crops, yielding ammonia. If applied to garden or lawn in a quantity sufficient to well blacken the soil or grass when rain threatens it does good, but it should not be dusted over young plants when fresh from the chimney, or it may injure them. If soot is put in a bag or piece of sacking and hung in a tub of water, a good liquid manure is formed.

Sophora (sōph-ora, from the Arabic *sophero*. Ord. Leguminosae).—The most popular member of this genus is japonica, the Pagoda Tree of China and Japan, which is hardy, grows 20 to 30 ft. high, and bears white flowers in summer. Pendula and variegata are drooping and variegated varieties respectively. It likes a friable loam. The species are raised from seed, and the varieties are grafted on to it.

Sophronitis (sophronī-tis, from *sophrona*, modest. Ord. Orchidaceae).—A small genus of Orchids, the most important of which is grandiflora, which produces bright scarlet flowers in winter; there are several varieties of it. It may be grown in a shallow pan, in peat and Sphagnum with a few pieces of charcoal, over crocks; or on a block. Propagation is by division. Although less water will be needed in winter than in summer, the plants must not be dried off. The genera Sophronitis and Cattleya have been crossed, giving the bigeneric Sophro-cattleyas. Sophronitis has also been crossed with Laelia, giving the bigeneric Sophro-Laelia. Further, Sophronitis grandiflora has been crossed with a Laelio-cattleya, giving trigeneric hybrids, or Sophro-Laelio-cattleyas. For particulars, *see* a modern book on Orchids.

Sorbus.—*See* Pyrus.

Sorrel.—*See* Kitchen Garden—Herbs.

Sowbread.—*See* Cyclamen.

Spade.—These tools are made in various sizes, but they should always be of steel, and mounted on strong Ash D handles. No. 3

is a useful medium size. They should be kept scraped when in use, and cleaned and oiled before being put away.

Spanish Bluebell, Scilla hispanica.

Spanish Iris.—*See* Iris.

Sparaxis (sparāx-is, from *sparasso*, to tear, in reference to the cut spathes. Ord. Irideae).—*See* Bulbs.

Sparmannia africana (sparmānn-ia, after A. Sparmann. Ord. Tilieae).—A handsome greenhouse shrub, growing from 6 to 20 ft. high, with white flowers showing a prominent brush of stamens in spring (*see* the *Botanical Magazine*, t. 516). It thrives in loam with a fourth of peat and some sand. Propagation is by cuttings in spring under a bell-glass in a warm house. It is very easily grown.

Spawn.—*See* Kitchen Garden—Mushrooms.

Specularia, Venus's Looking-glass (speculā-ria, from *Speculum Veneris*. Ord. Campanulaceae).—The only species grown much is Speculum, a purple hardy annual growing about a foot high and flowering in summer (syn. Campanula Speculum—*Botanical Magazine*, t. 102). *See* Annuals.

Speedwell.—*See* Veronica.

Sphagnum.—A moss much used by Orchid growers, principally owing to its sponge-like power of absorbing water; it grows in swampy places. It may be bought from florists and seedsmen.

Spider Orchis.—*See* Ophrys.

Spiderwort.—*See* Tradescantia.

Spigelia, Worm Grass (spigē-lia, after A. Spigelius. Ord. Loganiaceae).—A fairly large genus, only one species of which, marilandica, is much grown. This is a hardy perennial with reddish-yellow flowers in summer, growing about a foot high. It is a good rockery plant, thriving in peat and loam, with sand, and propagated by seed or cuttings. *See* the *Botanical Magazine*, t. 80.

Spinach, Spinacia oleracea (spinā-cia, from *spina*, a prickle, in allusion to the seed. Ord. Chenopodiaceae).—*See* Kitchen Garden.

Spindle Tree.—*See* Euonymus.

Spiraea, Meadow Sweet (spirāē-a, from *speira*, wreathed, in reference to its former use in garlands. Ord. Rosaceae).—A useful genus of shrubs giving material for greenhouses as well as for shrubberies. Astilbe japonica is generally grown under the name of Spiraea japonica, and is sold in the form of dormant roots by bulb dealers in autumn (*see* Bulbs). The Spiraea japonica of botanists is a different plant; it is a hardy evergreen, with rose flowers, and is synonymous with the Spiraea callosa of Thunberg; Anthony Waterer and Bumalda are varieties of it (*see* the *Botanical Magazine*, t. 5164). Of the hardy deciduous species for the shrubbery, Aitchisoni, arguta, Aruncus, Douglasi, Filipendula flore pleno, Lindleyana, palmata, and Thunbergi are particularly good. They thrive in most deep, fertile, fairly moist soils, and give long wreaths of bloom

in the summer. The common Meadow Sweet is Ulmaria; there are variegated-leaved and double forms of it. Astilboides, although hardy, is much used as a pot plant, and thrives in bulb soil; floribunda and Lemoinei are forms of it. The Spiraeas differ somewhat in their manner of flowering. Arguta and Thunbergi bloom on the previous season's wood, and the pruning should consist in removing the old wood after flowering, leaving the young unshortened to bloom the following year. Japonica and Douglasi bloom well on the same year's wood. These may be thinned and cut back in spring, like non-climbing Roses. Propagation of the shrubs is by cuttings of the young wood in a frame, or division if a number of suckers are thrown up from the roots.

Spleenwort.—*See* Asplenium.

Spore.—*See* Ferns.

Sport.—A natural break from the recognised character of a plant.

Spot.—A fungoid disease of Apples, Carnations, and other plants. *See* Fruit, Kitchen Garden, Carnations, etc.

Spraying.—*See* Fruit.

Sprekelia.—*See* Amaryllis under Bulbs.

Spruce.—The name is an abbreviation of Spruce Fir. The Spruces are Conifers belonging to the genus Picea. The "White Spruce" of the foresters is Picea alba, the "Black Spruce" P. nigra, and the common or Norway Spruce, P. excelsa. The first is a valuable tree in Canada, Newfoundland, and North America generally; but it is short-lived in Great Britain, and is not much planted as an ornamental tree nowadays, although it is sometimes used in plantations where cheap Conifers are wanted. The Black Spruce is also a North American tree. As the wood is soft it is much in demand for making paper pulp, now an important industry of Newfoundland. Spruce gum is an exudation from this tree, and Spruce beer is obtained by boiling the young branches of the Black and Red Spruces. The essence is boiled with other ingredients, mixed with molasses, allowed to ferment, and bottled. It is a good tree for moist, alluvial soils in Great Britain, but useless for dry ones. The common Spruce of British foresters is P. excelsa. It is a European tree, and has been grown in Great Britain for several hundreds of years. The wood is light and easily worked, but durable, hence it is an important timber tree. Young specimens are much in demand for Christmas trees. It is largely grown in Germany. *See also* Picea.

Spurge, Caper, Euphorbia Lathyris.

Spurge Flax, Daphne Mezereum.

Spurge Laurel, Daphne Laureola.

Spurgewort, Euphorbia.

Spurring.—*See* Pruning.

Squash.—*See* Gourd.

Squill.—*See* Scilla and Bulbs.

Squill, Striped, Puschkinia scilloides.

Stachys (stāch-ys, from *stachys*, a spike, in reference to the inflorescence. Ord. Labiateae).—A large genus, a few species of which are grown as ornamental plants, and one as a vegetable. Grandiflora (syn. Betonica grandiflora) is a hardy perennial with violet flowers in spring, growing about a foot high. Lanata (Lamb's Ear) has white, woolly foliage. Tuberifera is the Crosnes or Chinese Artichoke (*see* Kitchen Garden). Propagation is by seed and division in spring. Ordinary soil suits.

Staking.—*See* Fruit, Carnation, Dahlia, etc.

Standards.—Trees with clean stems 5 to 6 ft. high are called standards; those with 3 to 4-ft. stems are half-standards. *See* Fruit, Thorn, Laburnum, etc.

Stanhopea (stanhō-pea, after Earl Stanhope. Ord. Orchidaceae).—Hothouse Orchids with flowers in pendulous racemes, suitable for culture in suspended teak baskets in a compost of fibrous peat, Sphagnum, and charcoal. Propagation is by division. They like a good deal of water while growing, less in winter. Insignis, with yellow and purple fragrant flowers (*Botanical Magazine*, tt. 2948, 2949); and tigrina, orange and purple, sweet (*Bot. Mag.*, t. 4197), are two of the best; there are several varieties of the latter.

Stapelia, Carrion Flower (stapē-lia, after J. B. Stapel. Ord. Asclepiadeae).—Hothouse plants with large, livid, foetid flowers, thriving in loam with a good deal of sand and pounded brick. Propagation is by cuttings in sand. They resemble Cactuses in their love of sun and drought. Gigantea, purple and yellow; and grandiflora, purple, grey branches, are as much grown as any.

Staphylea (staphylē-a, from *staphyle*, a bunch, in allusion to the inflorescence. Ord. Sapindaceae).—Hardy deciduous shrubs, the most popular of which, colchica, has white flowers in summer when grown in the shrubbery, but is often grown in pots and forced into early bloom. It likes fibrous loam, with a quarter of decayed manure and some sand. Propagation is by seed in spring, cuttings in summer, and layers in autumn.

Star of Bethlehem.—*See* Ornithogalum and Bulbs.

Starwort.—*See* Aster.

Statice, Sea Lavender (stā-tice, from *statizo*, to stop, in reference to the astringency. Ord. Plumbagineae).—Graceful plants, some of which are esteemed for greenhouse and some for garden cultivation. Gmelini is a hardy perennial, with dark blue flowers in summer, about 18 ins. high. Incana nana is also fairly hardy, and has pink flowers, height 9 ins. Latifolia, hardy, blue, early summer, 1 ft., is very popular. Profusa is grown in the greenhouse, and has blue flowers in summer, height 2 ft. Sinuata, purple, summer, 1 ft., is not quite hardy (see *Botanical Magazine*, t. 71). Suworowi, lilac-pink, summer, 18 ins., is a hardy annual. Limonium is the Sea Lavender, and has purplish flowers in summer, height 18 ins. Bonduelli has yellow flowers in early summer, height 1 ft. They like a

friable loamy soil. The annuals are propagated by seeds, the shrubs by cuttings, and the perennials by division.

Stenactis.—*See* Erigeron. Stenactis speciosa is the same as Erigeron speciosum, a good hardy herbaceous plant.

Stephanotis (stephanō-tis, from *stephanos*, a crown, and *otos*, an ear, in reference to the ear-like protuberances on the stamens. Ord. Asclepiadeae).—A small genus, important only as containing the beautiful white, fragrant hothouse climber floribunda, which is so popular as a cut flower (*see* the *Botanical Magazine*, t. 4058). The Elvaston variety is perhaps superior to the common type. The Stephanotis is not difficult to grow, and is best planted out in a bed of turfy loam, with sand, and a third each of decayed manure and peat. The site should be one from which superfluous moisture can drain freely. It loves water, both at the root and overhead, in summer, and vigorous syringing will go a long way towards keeping mealy bug under; it should be done after gathering any flowers that may be wanted for wreaths, etc. Less water will be needed in winter, when a temperature of 55° to 65° will suffice. Go over the plant in winter and thin out weak and crowded growths; old wood may be shortened. A vaporising cone should be burned in the house occasionally. Propagation is by cuttings in bottom heat, choosing pieces of side shoot, and inserting in pots plunged in bottom heat and kept close.

Stereum (Silver Leaf).—*See* Fruit—Plum.

Sternbergia (sternbēr-gia, after Count Sternberg. Ord. Amaryllideae).—*See* Bulbs.

Stipa, Feather Grass (stī-pa, from *stipe*, feathery. Ord. Gramineae).—Hardy perennial Grasses, the most popular of which is pennata, the Feather Grass, which grows about 2 ft. high and flowers in summer. Elegantissima is good. They will thrive in ordinary soil, and are easily raised from seed sown out of doors in late spring, or in a greenhouse or warm frame in winter, to be hardened before being planted out.

Stock, Virginian.—*See* Malcomia and Annuals.

Stocks, Brompton, Intermediate, Ten-week, etc.—These are among the most popular of garden and greenhouse flowers. The Brompton Stock, Matthiola incana, is a hardy biennial; for culture, *see* Biennials. The Ten-week Stocks, M. incana annua, are half-hardy annuals; for culture, *see* Annuals; these may be subdivided into hoary-leaved (ordinary type) and smooth green (Wallflower-leaved). The Intermediate and East Lothian Stocks are splendid for pots, and if sown in summer, pricked off, potted, and repotted into 5 or 6-in., will bloom well in spring in the greenhouse. Crimson, scarlet, purple, and white are procurable in separate colours. They grow 12 to 18 ins. high. The Emperor Stock may be grown in the same way. They may be sown in spring for autumn bloom.

Stocks, Fruit.—*See* Fruit.

Stokesia cyanea (stokē-sia, after Dr. Stokes. Ord. Compositae). —A handsome hardy perennial, with blue flowers in summer, growing about 18 ins. high (*see* the *Botanical Magazine*, t. 4966). It likes a friable loamy soil, and is propagated by division in spring. It is suitable for the border or rockery.

Stoking.—*See* Greenhouse—Heating.

Stonecrop.—*See* Sedum.

Stone Pine, Pinus Pinea.

Stork's-bill.—*See* Pelargonium.

Stove.—*See* Greenhouse.

Stoves, Heating.—*See* Greenhouse—Heating.

Stratiotes aloides, Water Soldier (stratiō-tes, from *stratos*, an army. Ord. Hydrocharideae).—*See* Flower Garden—Aquatics.

Strawberry.—*See* Fruit.

Strawberry Tree, Arbutus.

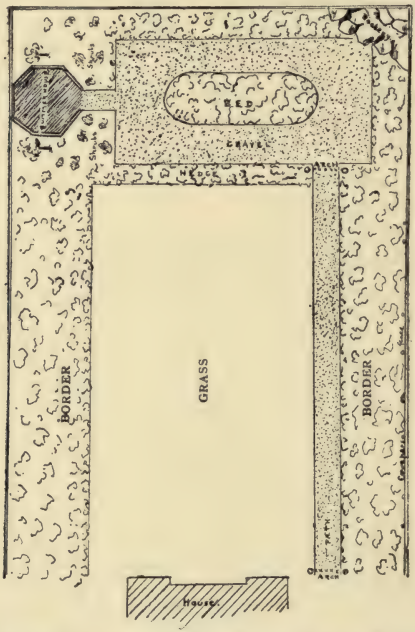
Strelitzia, Bird of Paradise Flower (strelītz-ia, after Charlotte of Mecklenburg-Strelitz, Queen to George III. Ord. Scitamineae).— Handsome evergreens for a warm greenhouse or conservatory, with flowers of remarkable form and brilliant colour. Reginae, the Bird of Paradise Flower, is the best known (*see* the *Botanical Magazine*, tt. 119, 120). It bears large orange and blue flowers in spring, and grows 3 to 4 ft. high; there are two or three varieties of it. Augusta is a larger species with purple and white flowers. Kewensis is a hybrid raised at Kew between Reginae and Augusta. They like loam and shattered brick, and are best planted out. Propagation is by seeds.

Streptocarpus (streptocār-pus, from *streptos*, twisted, and *carpos*, a fruit. Ord. Gesneraceae).—Beautiful herbaceous perennials for the warm greenhouse, much improved in recent years by cross-fertilisation; the flowers approach Gloxinias in size, and resemble them in form; the leaves are rough. The species are not much grown, cultivators preferring to buy mixed seeds of modern hybrids from a good firm. These should be sown in a warm greenhouse or frame in spring, pricked off, and potted as required till in 5 or 6-in. pots. They may also be propagated by leaf cuttings. Loam, with sand and a quarter of leaf mould, suits. The plants will be at their best the second year. They will require a good deal of water while in active growth.

Streptosolen Jamesoni (streptosō-len, from *streptos*, twisted, and *solen*, a tube. Ord. Solanaceae).—A free-growing evergreen shrub, with brilliant heads of orange flowers in spring and summer, suitable for the back wall of a warm greenhouse or a conservatory pillar. It thrives best when planted out in a compost of loam and leaf soil in equal parts, with sand. Propagation is by cuttings under a bell-glass. A good deal of water, both at the root and over the foliage, will be appreciated in summer. Syn. Browallia Jamesoni (*see* the *Botanical Magazine*, t. 4605).

Struthiopteris.—*See* Onoclea.

Styrax, Storax (stȳ-raxx, an Arabic name. Ord. Styraceae).—A small genus of shrubs, one species of which, japonica, is hardy and is popular on account of its pretty white flowers and pink buds in spring. It may grow 8 to 10 ft. high in good, loamy soil, lightened with leaf mould and sand. Propagation is by layers in autumn. Benzoin should be grown in a warm house and propagated by cut-



A Design for a Rectangular Suburban Back Garden.

The design provides: A central grass plot; a side path with arches at each end; two flower borders; creepers on the fences; an end section with flower bed, gravel, summer-house, rockery, and shrubs.

tings. Officinale, which yields the balsamic resin called storax, should be grown in a warm greenhouse except in mild, sheltered places.

Suburban Gardens.—There has been an enormous development in suburban gardening in recent years, and the movement is likely to spread. Both pleasure and benefit accrue from cultivating plants, and the practice is worthy of encouragement. Small suburban gardens are generally rectangular, and there is a tendency for them

to become stiff and formal; this can be corrected by a little forethought. It is generally helpful to divide the plot into two parts, separating one from the other with rustic-work. There may be an arched opening, and possibly a rustic gate. A small plot may be made interesting if a seat is set transversely under a tree in one angle, a small summer-house in another, and a group of shrubs in a third. The central area may be turfed, and a sun-dial set in the centre. The division between suburban gardens is often a low wall or fence. Both for the sake of privacy and ornament this should be heightened, and a simple plan is to set wooden trellis-work, 2, 3, or 4 ft. high, as the case may be, on the top. Ivy, Virginian Creeper, Winter Jasmine (nudiflorum), and other ramblers may then be planted to cover it. If cats are troublesome fix a strip of tanned fish netting above the trellis on light rods that afford pussy no support.

Flowers.—In gardens close to large towns Roses rarely thrive, and if there are factories near they are almost sure to fail. On the other hand, Carnations and Chrysanthemums do well. Sweet Peas are not quite so good, but they are better than Roses. The members of the Primula family are not suitable. Pansies and Violas are none too satisfactory. Dahlias do fairly well, but they are rather too bulky for some suburban gardens. A flower that should be specialised is the Michaelmas Daisy, for it is remarkably vigorous, and with a wise selection of sorts will give bloom from September to November inclusive. The majority thrive (*see* Annuals). The homely Zonal Geranium may be made use of, but not to the exclusion of hardy plants. Almost all kinds of bulbs succeed (*see* Bulbs). Unfortunately Wallflowers are not reliable in districts where the air is impure close to large towns, but they can be grown a little farther out. Hardy ferns may be grown (*see* Ferns).

Trees and shrubs.—Three of the best deciduous trees for suburban gardens are the Plane, the Linden, and the Poplar. The Lombardy Poplar is very useful for making a quick screen, as if the tops are cut off a year after planting the trees throw out a large quantity of side shoots from top to bottom. Of more ornamental trees may be named the Almond, the False Acacia (Robinia), and the Laburnum; the double crimson and white Thorns as standards. The best of all evergreens is the Aucuba, but the Euonymus is also good, and there is a yellow-leaved form which is very cheerful in winter.

Fruit.—Suburban gardens are rarely large enough to accommodate much fruit, but sometimes there is a space on a wall or fence. Cordon trees (*see* Fruit) are the most suitable form. Apples and Pears may both be chosen. Plums are rather too vigorous. A Morello Cherry may be grown as a fan on a wall or fence with an east aspect. Currants, Gooseberries, and Raspberries may be planted if there is room for them. A bed of Strawberries may be planted. For particulars of all these, *see* Fruit. Birds are not less troublesome in suburban than in country gardens, and crops must be protected from them.

Vegetables.—Want of space has its influence on the kitchen department. It would rarely be possible, even if it were desirable, to grow the large winter vegetables, such as Brussels Sprouts and

Kale; in any case they are best omitted, as in damp weather their odour is offensive, and they can be bought so cheaply that the space they would occupy can be utilised to better advantage. A few early Potatoes may be grown, if there is room, and likewise one or two rows of green Peas, as it is desirable to have these, particularly the latter, perfectly fresh. Kidney Beans, both French and Runner, are also worth growing where space permits, for the sake of getting them fresh. Another class worth thinking about is salading, as the flavour of Lettuces, Radishes, Endive, and other salads depends upon their being quite fresh. For details, *see* Kitchen Garden.

Succulents.—Plants with fleshy foliage, such as Cacti, Aloes, Agaves, Cotyledons, Crassulas, Sedums, Sempervivums, and Mesembryanthemums. For details, *see* the genera named.

Suckers.—Branches of shoots springing from the base of plants.

Sulphur.—A good fungicide. *See* Mildew.

Sumach.—*See* Rhus.

Sundew.—*See* Drosera.

Sunflower.—*See* Helianthus.

Sun Plant.—*See* Portulaca.

Sun Rose.—*See* Helianthemum.

Superphosphate.—*See* Manure.

Swainsona or **Swainsonia** (swainsō-na, after Mr. Isaac Swainson. Ord. Leguminosae).—Evergreen greenhouse shrubs, the best known of which is perhaps galegaefolia, a variety of coronillifolia, with purplish flowers in summer, height 4 to 6 ft. (syn. Colutea galegaefolia—*Botanical Magazine*, t. 792). They like loam with a third of peat, and sand. Propagation is by cuttings in summer.

Swamp Lily, Peruvian, Zephyranthes candida.

Swan-neck Orchid, Cycnoches.

Swan River Daisy, Brachycome iberidifolia.

Sweet Alyssum, Alyssum maritimum (syn. Königa maritima).

Sweet Amber, Hypericum Androsaemum.

Sweet Basil.—*See* Kitchen Garden—Herbs.

Sweet Bay, Laurus nobilis.

Sweetbrier, Rosa rubiginosa.

Sweet Chestnut, Castanea sativa.

Sweet Cicely, Myrrhis odorata.

Sweet Lime, Citrus medica Limetta.

Sweet Marjoram.—*See* Kitchen Garden—Herbs.

Sweet Pea.—It is a singular flower garden which does not contain a collection of Sweet Peas in these days. So beautiful are these flowers in the garden, so fragrant are they, so admirably are they adapted for vases, that it would be a mistake not to grow them, even if they were expensive and difficult to manage instead of being cheap and easy. At the least there should be a mixed row of giant "Spencer" varieties, which have larger and more beautiful flowers than the old type; and if possible there should be a row made up of small quantities of various good named sorts, or a set of clumps

along a border. Clumps made by setting plants a foot apart in a ring a yard across look charming. They can be sown where they are to bloom if desired, but most good growers prefer to raise the plants in pots or boxes under glass towards the end of winter, and plant them out with a good ball of soil and roots about mid-April. The ground ought to be well prepared for them (*see* Bastard trenching under Kitchen Garden, and Soil) in advance. Sticks should be put to them early. When they have got up the sticks and started flowering in earnest, soakings of water and liquid manure may be given in dry weather; this, with regular picking of the flowers, will insure blossom for many weeks. A coat of short decayed manure spread along the surface will do good. Sweet Peas thrive in almost any kind of soil when the cultivation is thorough, but they do not give of their best in shallow, dry soil.

The following are splendid varieties of Sweet Peas:—

Etta Dyke and Nora Unwin, white.
Clara Curtis and Primrose Paradise, cream.
Evelyn Hemus and Mrs. C. W. Breadmore, Picotee edge, cream ground.
Paradise Ivory, ivory.
Marie Corelli, magenta-rose.
Elsie Herbert, Picotee edge, white ground.
Princess Victoria and Mrs. Hardcastle Sykes, pale pink.
Countess Spencer and Constance Oliver, deep pink.
Mrs. Hugh Dickson and Mrs. Henry Bell, cream-pink.
Earl Spencer and Stirling Stent, salmon.
Zarina, salmon-pink.
Mrs. A. Ireland and Arthur Unwin, bicolor.
Cherry Ripe and Chrissie Unwin, cerise.
Eric Harvey, pink and white.
Tennant Spencer and Helio-paradise, mauve.
Asta Ohn and Flora Norton Spencer, blue.
Mrs. W. J. Unwin and Aurora Spencer, red flake.
Suffragette, blue flake.
Doris Burt, cerise-scarlet.
Scarlet Monarch and George Stark, scarlet.
Helen Lewis and Edna Unwin, orange.
Sunproof Crimson and Maud Holmes, crimson.
Nubian and Maroon Paradise, maroon.
Mrs. Townsend, white, blue edge.

The descriptions show what a great range of colours we have in the Sweet Pea, but the number of tints is not exhausted, as those will find who visit Sweet Pea shows or large trial grounds.

Sweet Scabious.—*See* Scabious.

Sweet Sultan.—*See* Centaurea and Annuals.

Sweet William.—*See* Dianthus and Biennials.

Sycamore.—*See* Acer.

Symphoricarpus, Snowberry (symphoricār-pus, from *sumphoreo,* to bear together. Ord. Caprifoliaceae).—Hardy, free-growing shrubs, the most popular of which is racemosus; it has rose flowers

in early summer, followed by white fruits, which are eaten by game; height about 6 ft. (syn. Symphoria racemosa—*Botanical Magazine*, t. 2211). Occidentalis is also grown. They are not fastidious as to soil. Propagation is by suckers or cuttings in autumn.

Syringa, Lilac (syrīn-ga, from the Persian *syrinx*. Ord. Oleaceae).—*See* Lilac.

Syringe.—A garden implement of much value in hot weather, when the occupants of vineries, Peach houses, Orchid houses, and indeed plant houses generally, benefit greatly by "damping down," that is, syringing the glass, walls, and paths, about 3 p.m. This creates a refreshing humid atmosphere. In many but not all cases the plants themselves are benefited by syringing. In buying a syringe it is worth while to consider getting one with a spraying as well as a plain nozzle; it can then be used for applying fungicides and insecticides.

Tabernaemontana (tabernaemontā-na, after J. T. Tabernaemontanus. Ord. Apocynaceae).—Hothouse shrubs, the best of which, coronaria and its double variety flore pleno, are very useful, owing to the abundance of fragrant white flowers that they give in summer. They grow 3 to 4 ft. high. Crispa is a fringed variety of coronaria. Fibrous peat and loam in equal parts, with sand, make a good compost. Propagation is by cuttings inserted in heat in spring or autumn under a bell-glass. The young plants thus raised should be pinched to induce a compact habit. The plants may be trimmed after flowering, cutting out old flowered wood.

Tacsonia (tacsō-nia, from the Peruvian name *Tacso*. Ord. Passifloreae).—Brilliant greenhouse climbers, closely related to the Passifloras. They look best when trained, not too stiffly and tightly, under a greenhouse or conservatory roof. Van Volxemi (syn. grandis) is perhaps the most popular; it has large crimson flowers in summer, and thrives in a cool house (*see* the *Botanical Magazine*, t. 5571). Insignis, also crimson, likes rather more heat (syn. Passiflora insignis—*Bot. Mag.*, t. 6069); Manicata (syn. ignea), scarlet (*Bot. Mag.*, t. 6129), is good. They thrive in loam with sand and a fourth each of decayed manure and leaf mould, and should be planted out in preference to being kept in pots. A deep bed should not be made, or the growth will be too luxuriant; in any case thinning will be needed now and then. The shoots which have flowered should be cut back to the old wood in winter, and fresh flowering growths will then push. Propagation is by cuttings of young shoots in spring, in a warm, close case or under a bell-glass. Syringing will tend to keep mealy bug and red spider in check, but the house should be vaporised with a cone every fortnight through the growing season.

Tagetes, Marigold (tagē-tes. Ord. Compositae).—The African Marigold is T. erecta, and the French, T. patula (*Botanical Magazine*, t. 150); *see* Marigold and Annuals. The variety of T. signata called pumila is popular; it grows about a foot high, and covers itself with small yellow flowers in summer; it may be grown from seed sown out of doors in spring, and will thrive in almost any soil.

Tamarix, Tamarisk (tām-arix, tām-arisk, from Tamaris, the old name of a river. Ord. Tamariscineae).—Valuable shrubs for seaside branching, of dense habit. Chinensis (syn. japonica plumosa or simply plumosa) is quite hardy, and bears pink flowers freely in summer. Gallica (syns. anglica, africana, and parviflora of gardens) and hispida (syn. kashgarica) are also hardy; the former has pale pink and the latter carmine-rose flowers. The variety of hispida called aestivalis, mauve, is very fine if pruned hard every spring. It makes a good bed mixed with Liliums umbellatum and tigrinum. The Tamarisks like a sandy soil, and may be propagated by cuttings in a warm frame or house.

Tanacetum, Tansy (tanacē-tum. Ord. Compositae).—The Tansy is used for garnishing. *See* Herbs.

Tangier Pea, Lathyrus tingitanus.

Tar.—Useful in gardens, coal tar as a preservative of wood, Stockholm tar as a dressing for wounds on trees made in pruning or excising canker.

Tarragon (Artemisia dracunculoides).—*See* Kitchen Garden—Herbs.

Taxodium (taxō-dium, from *taxus*, Yew, and *oides*, like. Ord. Coniferae).—Deciduous trees, the most popular of which, distichum, is a deciduous, Cypress-like plant, with a thick trunk and swollen base, often called the deciduous or swamp Cypress; denudatum, fastigiatum, pendulum, and nanum are varieties. Heterophyllum and mucronatum are other species grown to some extent. They like a moist situation, rarely thriving in hot, dry sites. Propagation is by seeds, cuttings, and layers.

Taxus, Yew (tāx-us, from *taxon*, a bow, in allusion to the old use of the wood. Ord. Coniferae).—Hardy evergreen trees, of interesting, if somewhat sombre, appearance. The common Yew of the churchyard is T. baccata; there are many varieties of it, among which may be mentioned argentea, silver striped; aurea, yellow; Dovastoni, drooping, and its sub-varieties aureo-pendula and variegata; erecta, upright; fastigiata, pyramidal, the Irish Yew, and its variegated forms; and fructu-luteo, with yellow fruit. T. Canadensis is the Canadian Yew. The Yew has been planted a good deal of late years as an inner hedge plant, and clipped into formal shapes, as in topiary. The drawback to its use as a boundary hedge is that it is poisonous to cattle and horses. Small plants of the variegated Yews look well in the border and in window-boxes. The Yews are not particular as to soil. Propagation is by seed in spring, cuttings in a frame in summer, or layers in autumn. Special varieties are increased by grafting.

Tecoma (tecō-ma, a contraction of *Tecomaxochili*, the Mexican name. Ord. Bignoniaceae).—Twining shrubs, with large showy tubular flowers. Grandiflora (syn. Bignonia grandiflora), scarlet, is nearly hardy, and may be grown outside except in cold places; it flowers in summer. Jasminoides, with white and red flowers in summer, should be grown in a greenhouse. Radicans (syn. Bignonia

radicans), scarlet, summer, is hardy on a wall (*see* the *Botanical Magazine*, t. 485); praecox is an early and Thunbergi a late variety of it. The Tecomas like sandy loam, and are propagated by seeds or root cuttings.

Tecophilaea (tecophilāē-a, after Tecophila. Ord. Haemodoraceae).—A pretty Crocus-like bulb, T. Cyanocrocus produces its blue, white-throated flowers in spring on stems about 6 ins. high. Leichtlinii and Regelii are varieties of it. They like a light, friable loamy soil, and are propagated by seed in spring or offsets while dormant. Good for rockery or frame culture.

Telekia.—*See* Buphthalmum. Telekia speciosa (*Botanical Magazine*, t. 3466) is the same as Buphthalmum speciosum, a hardy herbaceous perennial.

Tellima (tēll-ima, an anogram of *Mitella*. Ord. Saxifrageae).—An unimportant genus, one species of which, grandiflora, a hardy perennial with greenish flowers in April, growing about 2 ft. high, is worth growing. It likes sandy peat. Propagation is by seed or division in spring. *See* the *Botanical Register*, t. 1178.

Terraces.—When a house is built on sloping ground levelling is necessary, and it is not unusual to form a terrace in front of the principal rooms, supported by a wall or bank. With a large area available more than one terrace may be made. The levels may be laid out as gardens, and the walls planted with suitable climbers.

Testudinaria elephantipes, Elephant's Foot (testudinā-ria, from *testudo*, a tortoise. Ord. Dioscoreaceae).—A singular plant, with a large woody covering to the rootstock; it is a deciduous climber with yellow flowers in summer, requiring a warm greenhouse. Loam and peat in equal parts, with sand, suit. Propagation is by cuttings under a bell-glass in spring. Syn. Tamus elephantipes (*Botanical Magazine*, t. 1347).

Thalictrum, Meadow Rue (thalīc-trum, from *thallo*, to become green. Ord. Ranunculaceae). — Hardy herbaceous perennials, admired as much for their elegant fern-like foliage as for their flowers, which, however, are also attractive. The most popular species, perhaps, is minus (syn. adiantifolium), the foliage of which resembles the Maidenhair Fern; the yellow flowers are borne in early summer on stems about a foot high; there are several varieties. Anemonoides (syn. Anemone thalictroides — *Botanical Magazine*, t. 866), with yellow flowers in early spring; and aquilegifolium, purple flowers in early summer (*Bot. Mag.*, t. 1818), grow about a yard high; atropurpureum is a good dark variety of the latter. They are good for the herbaceous border, where they thrive in friable loamy soil. Propagation is by division of the rootstock in spring.

Thermometer.—An instrument for registering the temperature. There are three scales in use; the Fahrenheit, in which the freezing point of water is 32° and the boiling point 212°; the Réaumur, freezing point 0° and boiling point 80°; and the Centigrade or Celsius, freezing point 0°, boiling point 100°. These scales may be

converted into each other as follows: (*a*) Centigrade into Fahrenheit: (1) if the temperature be above freezing (0° C.) multiply by 9, divide by 5, and add 32; (2) if below 0° C., but above —18° C., multiply by 9, divide by 5, and subtract the result from 32; (3) if below —18° C., multiply by 9, divide by 5, and subtract 32 from the result. (*b*) Fahrenheit into Centigrade: (1) if above 32° F., subtract 32, multiply by 5, and divide by 9; (2) if below 32° F., but above 0° F., add the temperature to 32, multiply by 5, and divide by 9. (*c*) Réaumur's scale is converted in the same way, 4 being used instead of 5. Thermometers should be fixed in a central position in a house, and shaded from the sun. A "plunging" thermometer, with a long perforated tube, is made for testing the heat of beds.

Thinning.—A practice which becomes the more necessary the thicker the plants come up. Crowded plants are rarely good (*see* Annuals, Vegetables, Fruit, etc.). Thin sowing saves much labour in thinning. Thinning is best done when the soil is moist.

Thistle.—*See* Carduus and Cnicus.

Thistle, Globe.—*See* Echinops.

Thistle, Melon.—*See* Cactus—Melocactus.

Thomas's Phosphate Powder.—*See* Manures—Basic slag.

Thorn.—*See* Crataegus.

Thorn Apple, Datura Stramonium.

Thrift, Armeria maritima.

Thrips.—A small, lively insect (Heliothrips Adonidum) which infests both the foliage and flowers of many plants, indoors and out. Vigorous syringing and vaporising with cones at fortnightly intervals from April to October under glass will keep it in subjection. Out of doors syringing with a paraffin emulsion is good (*see* Paraffin). Peas sometimes succumb to thrips when languishing in poor or dry soil. With liquid manure and mulching they make a better fight.

Thuja (Thujopsis).—*See* Thuya.

Thunbergia (thunbēr-gia, after C. P. Thunberg. Ord. Acanthaceae).—Beautiful evergreen warm-house climbers. The most popular is alata, which bears yellow flowers in summer (*see* the *Botanical Magazine*, t. 2591); alba, white; and aurantiaca, orange, are varieties of it. Although they are perennials they are best treated as annuals; coccinea, scarlet; erecta (syn. Meyenia erecta —*Bot. Mag.*, t. 5013), orange and blue; fragrans, white, sweet; and grandiflora, blue (*Bot. Mag.*, t. 2366), are other good species. They may be grown against low pillars. Alata is good for hanging baskets, and may be grown in a cool house. Propagation is by seeds sown in a warm house or frame in spring, or by cuttings in a warm case in summer. Loam, with a third of peat, and a little decayed manure or leaf mould, suits.

Thunia.—Now classed with Phaius, which see.

Thuya, Arbor Vitae (thū-ya, from *thyon*, sacrifice; the resin was used as incense in sacrifice. Ord. Coniferae).—Hardy evergreen

Conifers, one of which, occidentalis, is the well-known Arbor Vitae or White Cedar, sometimes grown as a garden hedge. There are numerous varieties of it, among which dumosa (syn. pygmaea), ericoides, lutea, nana, pendula, argenteo-variegata, and aureo-variegata may be mentioned. Orientalis (syn. Biota orientalis), the Chinese Arbor Vitae, also has many varieties, notably argenteo-variegata, aureo-variegata, elegantissima, pendula, and pygmaea. Dolabrata is a handsome Thuya, and its variegated form is good; these are quite good enough for lawn trees. Gigantea is the largest species, and has several varieties. Thuyas like fertile, well-drained loamy soil. Propagation is by seed in a frame in spring and cuttings in a frame in summer.

Thyme, Thymus (thȳ-mus, from *thuo*, to perfume. Ord. Labiatae).—Aromatic shrubs, used both for the kitchen and flower garden. T. vulgaris is the common garden Thyme, and T. citriodorus the Lemon Thyme (*see* Kitchen Garden—Herbs). T. Serpyllum and its varieties albus, white; atropurpureus, purple; coccineus, red; lanuginosus, woolly; and variegatus, variegated leaves, are used as carpeters on the rockery. They are not particular as to soil. Propagation is by seed in spring, also by cuttings and division.

Thyrsacanthus rutilans (thyrsacān-thus, from *thyrse*, a thyrse, and *Acanthus*. Ord. Acanthaceae).—A winter-flowering hothouse plant, with scarlet flowers in winter, height about 2 ft. Peat and loam in equal parts, with sand, suit. Propagation is by cuttings in a warm case in summer.

Tiarella cordifolia, Foam Flower (tiarēl-la, from *tiara*, in reference to the shape of the seed pod. Ord. Saxifrageae).—A beautiful hardy herbaceous perennial, with white flowers in feathery racemes in spring, when it is one of the best ornaments of the border or rockery. Peaty soil suits it. Propagation is by division in spring. *See* the *Botanical Magazine*, t. 1589.

Tibouchina (tibouchī-na, a native name. Ord. Melastomaceae).—Evergreen shrubs, suitable for the roof of a warm greenhouse or conservatory. Elegans and semidecandra (syn. Pleroma macranthum), both with purple flowers in summer, are the best; there is a good variety of the latter called floribunda. Loam and peat in equal parts, with sand, suit. Propagation is by cuttings in a close case in summer.

Tiger Lily (Lilium tigrinum).—*See* Bulbs.

Tigridia, Tiger Flower (tigrīd-ia, from *tigris*, a tiger, and *eidos*, like. Ord. Irideae).—*See* Bulbs.

Tilia, Lime, Linden (tīl-ia, Virgil's name. Ord. Tiliaceae).—*See* Lime.

Tillandsia (tillānd-sia, after Dr. Tillands. Ord. Bromeliaceae).—Hothouse evergreens, with richly coloured leaves and bracts. Peat and loam in equal parts, with sand and small crocks, suit. Propagation is by suckers in spring. Corallina (syn. Vriesia corallina), Lindeni, splendens, and tessellata are a few of the best species. There are many handsome hybrids, such as Duchartrei, Rex, and splendida.

Tipula (Daddy-longlegs).—*See* Daddy-longlegs.

Toad.—A friend of the gardener, as it feeds on slugs and insects. For this reason it is sometimes put into plant houses.

Toadflax.—*See* Linaria.

Tobacco.—*See* Nicotiana.

Todea (tō-dea, after Herr Tode. Ord. Filices).—Filmy ferns, requiring to be grown in a close case in a saturated atmosphere (*see* Ferns). Superba is the best. Hymenophylloides is also good.

Tomato (Lycopersicum esculentum).—*See* Kitchen Garden. Strictly, the Tomato is a fruit, but it is more often used as a vegetable, and is accepted as such at shows.

Tools and Appliances.—Garden tools should always be cleaned after use, and rubbed over with a greasy rag. The tool-shed should be dry. An adequate set are essential to good work. The principal kinds are spade, fork, rake, Dutch hoe, draw hoe, Canterbury hoe, trowel, knives, sécateurs, billhook, hedge shears, edging shears, wheelbarrow, roller, besom, reel and line, hammer and nails, hone for sharpening, shovel, syringe, lawn-mower, water-cans in sizes, dibber, water-barrow, hose, thermometer.

Top-dressing.—A substitute for repotting. Two inches of the top soil is removed from the contents of a flower-pot, and fresh compost applied.

Topiary.—The pruning of trees and shrubs into fanciful or formal shapes. It is an old practice which has enjoyed a revival in recent years, but is not to be recommended for general adoption. Yew, Box, and Holly are the principal subjects.

Torch Lily.—*See* Kniphofia.

Torch Thistle.—*See* Cactus—Cereus.

Torenia (torē-nia, after the Rev. A. Toren. Ord. Scrophularineae).—Pretty hothouse herbaceous perennials, suitable for pots and hanging baskets. Asiatica, purple, summer, 1 ft.; flava (syn. Bailloni), yellow, dark throat, summer, 1 ft. (*Botanical Magazine*, t. 6700); and Fournieri, purple, blue, and yellow, summer, 1 ft., are the most popular species; there is a variety of the latter called compacta. Loam and peat in equal parts, with sand, suit. Propagation is by seeds in a warm house or frame in spring, or by cuttings.

Town Gardening.—The remarks made under Suburban Gardening apply to town gardening, with greater emphasis in the case of certain plants, such as Roses. But much depends upon the town. There are many fairly large towns, free from factories, where the air is pure enough to suit the great majority of plants, including Roses; there are numerous others, small and large, where the air is too smoky or too charged with acid to grow plants of delicate constitution. The town gardener, battling with unfavourable conditions, is wise to concentrate on a few kinds with which he has good prospects of succeeding. The Chrysanthemum is a notable case. It will thrive under conditions that would be fatal to Roses, and is a beauti-

ful and interesting plant. By making a choice of varieties bloom can be had for six months if there is glass. For other town plants, *see* Suburban Gardening, p. 296.

Trachelium caeruleum, Throatwort (trachē-lium, from *trachelos*, the neck, in allusion to its virtue in diseases of the trachea. Ord. Campanulaceae).—A greenhouse herbaceous perennial, growing about 2 ft. high, with light blue flowers in summer and autumn (*see* the *Botanical Register*, t. 72). Album is a white variety. Loam, with sand and a fourth of leaf mould, suits. Propagation is by seeds in a warm house or frame in spring, or by cuttings in spring; young plants should be stopped to induce a compact habit.

Trachycarpus (trachycār-pus, from *trachys*, rough, and *karpos*, fruit. Ord. Palmae).—Fan palms. T. excelsa (syn. Fortunei) is the same as Chamaerops humilis, and may be grown out of doors in mild, sheltered places only. Martiana should be kept in a greenhouse. Loam, with sand and a third of peat, suits. Propagation is by seeds in heat.

Tradescantia, Spiderwort (tradescān-tia, after J. Tradescant. Ord. Commelinaceae).—Vigorous herbaceous perennials, one of which, zebrina (syn. Zebrina pendula), is a great favourite for hanging baskets; it may be grown in pots stood in ornamental vases in rooms; its foliage is prettily striped, and its habit pendulous; if given sufficient water it grows luxuriantly, and forms a new shoot at every broken tip; it may therefore be propagated readily by cuttings. Reginae also has pretty leaves. Virginiana (syn. Virginica) is the popular hardy Spiderwort; it grows about a foot high, and has blue flowers in spring (*see* the *Botanical Magazine*, t. 105); there are several varietes, including a white and a double. They will thrive in ordinary soil, and are propagated by division in spring.

Tragopogon, Goat's Beard (tragopō-gon, from *tragos*, a goat. Ord. Compositae).—Porrifolium is the Salsify (*see* Kitchen Garden). Pratensis is the common Shepherd's Clock. Both are biennials, with yellow flowers in late spring. Ordinary soil. Propagation is by seed in spring.

Traveller's Joy, Clematis Vitalba.

Tree Mallow, Lavatera arborea.

Tree of Heaven, Ailantus glandulosa.

Trees.—*See* Flower Garden.

Trefoil.—*See* Trifolium.

Trellis.—Expanding wooden trellis, which seedsmen supply, is useful for forming screens and shelters quickly. It should be covered with climbers as speedily as possible, to take off the stiffness. The trellis should be secured to strong uprights, and should be painted green or creosoted.

Trenching.—*See* Kitchen Garden.

Trichinium (trichīn-ium, from *trichinos*, hairy. Ord. Amarantaceae).—T. Manglesi is a charming little greenhouse perennial,

growing a bare foot high, and bearing fluffy pink flowers in June. It likes loam and peat in equal parts. Propagation is by seeds or root cuttings in a warm house or frame in spring.

Trichomanes, Bristle Fern (trichōm-anes, from *thrix*, a hair, and *manos*, soft, in allusion to the stems. Ord. Filices).—Beautiful ferns, one of the most popular of which is radicans, the Killarney Fern, a wilding in Ireland; Andrewsii, crispum, and dilatatum are varieties of it. They like a humid atmosphere, with shade. Fibrous peat suits them, over abundance of drainage.

Tricyrtis (tricȳr-tis, from *treis*, three, and *kyrtos*, convex, in allusion to the sepals. Ord. Liliaceae).—The most popular species is hirta, a hardy herbaceous perennial, with white, purple-spotted flowers in autumn, height about 2 ft. It thrives in sandy soil on the rockery, and is propagated by division in spring. *See* the *Botanical Magazine*, t. 5355.

Trientalis, Wintergreen (trientā-lis, one-third, in allusion to the low height. Ord. Primulaceae).—A small genus of hardy herbaceous perennials, suitable for a shady part of the rockery, in loamy soil. Americana and europaea both have white flowers in summer, and grow about 9 ins. high. Propagation is by seed or division under glass in spring.

Trifolium, Trefoil (trifō-lium, from *treis*, three, and *folium*, a leaf—three-leaved. Ord. Leguminosae).—The Clovers are, of course, more important as farm than as garden plants, but one or two are good enough for the rockery, notably alpinum, pink; and pannonicum, yellow and white, both early summer bloomers. Hybridum is the Alsike, and repens the white Clover; the latter is often used as Shamrock, although the yellow suckling, minus, has perhaps better claims. They grow in ordinary soil, and are propagated by seed in spring.

Trillium, Wood Lily (trīll-ium, from *trilix*, triple, in allusion to the three petals. Ord. Liliaceae).—*See* Bulbs.

Triteleia (tritelē-ia, from *treis*, three, and *teleios*, complete; parts of flower in threes. Ord. Liliaceae).—These bulbs are now included with the Brodiaeas by botanists. Uniflora, the most popular species, has lilac flowers in spring; height 3 ins. *See* Bulbs.

Triticum, Wheat, Couch (trīt-icum. Ord. Gramineae).—This genus includes a beneficent plant in vulgare, the Wheat Plant; and a troublesome one in repens. *See* Couch Grass.

Tritoma.—*See* Kniphofia.

Tritonia (tritō-nia, from *triton*, a weathercock, in allusion to the different directions of the stamens. Ord. Irideae).—*See* Bulbs.

Trollius, Globe Flower (trōll-ius, from *trol*, round. Ord. Ranunculaceae).—Useful hardy herbaceous plants, with bright yellow or orange flowers in spring. Asiaticus (*Botanical Magazine*, t. 235) has dark yellow and europaeus pale yellow flowers in late spring or early summer, height about 18 ins. There are several varieties of both; aurantiacus is a deep-coloured form of asiaticus; albidus,

Newry Giant, and Flore pleno are forms of europaeus. They will grow in most soils, but like a moist clayey or boggy mould. Propagation is by division in autumn.

Tropaeolum, Indian Cress, Garden Nasturtium (tropāē-olum, from *tropaion*, a trophy. Ord. Geraniaceae).—We saw under Nasturtium that that generic name belongs to the Water Cress, and that the garden Nasturtiums are really Tropaeolums. The genus is a large one, and includes both hardy and tender, annual and perennial species. Aduncum (*Botanical Register*, t. 718—syns. canariense and peregrinum) is the Canary Creeper, a nearly hardy annual raised from seed in a greenhouse or frame in spring. Azureum (*Botanical Magazine*, t. 3985) is a greenhouse perennial, blue, autumn bloomer; grandiflorum is a large variety. Jarrattii is also a greenhouse perennial, with orange flowers. Lobbianum (*Bot. Mag.*, t. 4097) is a scarlet greenhouse annual; there are many varieties. Majus and minus are the tall and dwarf hardy annual Nasturtiums (*see* Annuals). Polyphyllum (*Bot. Mag.*, t. 4042) is a prostrate hardy perennial with yellow flowers; it likes a sunny spot in the rockery. Speciosum (*Bot. Mag.*, t. 4323) is the beautiful Flame Nasturtium, a hardy perennial, which thrives in Scotland and other moist climates. Tricolorum is a hardy perennial with scarlet and orange flowers. The tuberous-rooted species should be lifted and stored in autumn; they may be propagated by division. The annuals are raised from seed in spring. All thrive in friable loam.

Trowel.—A useful transplanting tool, with which plants can be shifted without shaking the soil from the roots.

Truffles.—An edible fungus, growing beneath the surface of the soil, often in the shade of Beech trees, and found with the aid of small trained dogs.

Trumpet Flower.—*See* Bignonia.

Truss.—An umbel of flowers, each flower stem springing from a common centre.

Tsuga (tsū-ga, the Japanese name. Ord. Coniferae).—Hardy evergreens. Canadensis (syns. Abics, Picea, and Pinus canadensis) is the Hemlock Spruce; there are many garden varieties, of which a few of the best are albo-spica, white-tipped; gracilis, drooping; and nana, dwarf. Hookeriana, Mertensiana (syns. Abies Albertiana and A. Mertensiana), and Pattoniana, the Californian Hemlock Spruce, are also popular kinds. The culture is the same as for Pines. *See* Pinus.

Tuber.—An underground stem containing buds, *e.g.*, the Potato.

Tuberose (Polianthes tuberosa).—*See* Bulbs.

Tulip, Tulipa (tū-lipa, from *thoulyban*, a turban. Ord. Liliaceae).—*See* Bulbs.

Tulip, Butterfly.—*See* Bulbs—Calochortus lilacinus.

Tulip Tree, Liriodendron tulipifera.

Tunica Saxifraga (tū-nica, from *tunica*, a coat, in allusion to the calyx. Ord. Caryophylleae).—A pretty hardy perennial for the rockery, with white flowers in summer. It likes sandy loam. Propagation is by seed in spring.

Turf.—*See* Flower Garden—Grass.

Turnip.—*See* Kitchen Garden.

Tussilago Farfara, Coltsfoot (tussilā-go, from *tussis*, a cough. Ord. Compositae).—A troublesome weed in gardens, with broad, thick, round leaves and yellow flowers in spring; it should be kept under strict subjection. The Winter Heliotrope, Tussilago fragrans, is now called Petasites fragrans. *See* Petasites.

Tutsan, Hypericum Androsaemum.

Typha, Bulrush, Cat-o'-nine-tail, Reed Mace (tȳ-pha, the Greek name. Ord. Typhaceae).—Aquatics, of which latifolia, the British Reed Mace, has long, reddish spikes in summer. Angustifolia is smaller. Both may be cut early for winter decoration. They like marshy ground, and may be propagated by division in spring.

Ulex, Furze, Gorse, Whin (ū-lex, from the Celtic *ac*, point. Ord. Leguminosae).—Hardy evergreens, with spiny foliage, well suited to growing on sandy heaths, in bloom for many months. Europaeus is the popular species; flore pleno is a double form of it; and strictus, another variety, is the Irish Furze. Nanus is a small species, also yellow. The common Furze is raised from seed in spring. Flore pleno and erectus are propagated by cuttings in a frame in autumn.

Ulmus, Elm (ūl-mus, from the Celtic *ulm*. Ord. Urticaceae).—*See* Elm.

Umbilicus.—*See* Cotyledon.

Umbrella Pine, Sciadopitys verticillata.

Urceocharis Clibrani (urceō-charis. Ord. Amaryllideae). — A hybrid between Eucharis grandiflora and Urceolina pendula, with white drooping flowers in spring and summer, height 18 ins. For culture, *see* Eucharis.

Urceolina pendula (urceolī-na, from *urceolus*, a small cup, in allusion to the small nectary. Ord. Amaryllideae).—A pretty greenhouse bulb, with drooping umbels of yellow and green flowers in early summer. Loam and leaf soil in equal parts, with sand, suit. Propagation is by offsets while dormant. *See* the *Botanical Magazine*, t. 5464.

Utricularia, Bladderwort (utriculā-ria, from *utriculus*, a small bottle, so called on account of the small bodies on the leaves. Ord. Lentibularieae).—An interesting genus, embracing aquatic species provided with small pitchers, which capture and feed on small insects. Montana (*Botanical Magazine*, t. 5923), with white and yellow flowers in summer, height 6 ins., is the best known. It may be grown in Sphagnum moss and fibrous peat in a hanging basket in a warm house so long as it is provided with large quantities of water. Propagation is by division while dormant.

Vaccinium, Bilberry, Cranberry, Blackberry, Huckleberry, Whortleberry (vac-cīn-ium. Ord. Vacciniaceae).—A large genus of hardy shrubs and small trees, producing edible berries. Corymbosum (*Botanical Magazine*, t. 3433), white flowers and bluish-black berries; Myrtillus, rose flowers and blue fruits, the Bilberry, Blackberry, or Whortleberry; and Vitis-Idaea, pink flowers and red fruits, the Cowberry or Flowering Box, are the best known. All are deciduous except the last, which is evergreen. They thrive in sandy peat. Propagation is by seed in spring.

Valerian, Greek, Polemonium caeruleum.

Valerian, Red, Centranthus ruber.

Valeriana, Valerian (valeriā-na, after Valerius, who used it medicinally. Ord. Valerianeae).—Closely allied to Centranthus. Dioica, rose, is the Marsh, and officinalis, pink, the Common Valerian or All-heal; they flower in summer. Ordinary soil. Propagation by seed or division.

Vallisneria spiralis (vallisnē-ria, after Signor Vallisneri. Ord. Hydrocharideae).—An interesting half-hardy aquatic, with grass-like leaves and white flowers in summer. The system of fertilisation is unusual. The male flowers are at the base of the plant, in the water, from which they rise to the surface. The female flowers come to the surface when ready for fertilisation, after which process they are lowered to the bottom of the water by the spiral contraction of the stems. The plant may be grown in a tub in a winter temperature of about 45°. Propagation is by seeds or division.

Vallota, Scarborough Lily (vallō-ta, after M. P. Vallot. Ord. Amaryllideae).—A popular greenhouse bulb, with bright red flowers in summer, Vallota purpurea grows about 2 ft. high, and makes a nice greenhouse or window plant. It should be potted in early summer, in equal parts of loam and leaf soil, with a good deal of sand, but annual repotting should be avoided; it is better to top-dress and give liquid manure. Propagation is by offsets. Magnifica and major are large varieties. A great deal of water will be needed in summer. Syn. Amaryllis purpurea (*Botanical Magazine*, t. 1430).

Vanda (vān-da, the Sanskrit name. Ord. Orchidaceae).—A large genus of hothouse Orchids, mostly with erect stems, thick, recurved leaves, and flowers in racemes. Caerulea is a beautiful species, with large pale blue flowers in autumn, height 2 to 3 ft.; Fowleriana is a fine variety of it. Sanderiana, pink, yellow, and crimson, 3 ft., summer, immense flowers, is a splendid plant, of which albata is a good white ground variety. Suavis, various colours, 6 to 8 ft., autumn, is very fragrant (*see* the *Botanical Magazine*, t. 5174); Chatsworth, flava, and rubra are three varieties. Teres, white, rose, and magenta, 3 to 6 ft., spring (*Bot. Mag.*, t. 4114), is popular. Other good species are Amesiana, insignis, Kimballiana, and tricolor. They like a mixture of fibrous peat and Sphagnum over abundance of crocks. They enjoy shade when making their growth, except teres, and likewise abundance of root

and atmospheric moisture; little water should be given when growth is complete. Propagation is by basal growths, with roots attached. There are several hybrid Vandas, for which see a modern work on Orchids.

Vegetable Marrow.—*See* Kitchen Garden.

Vegetable Garden.—*See* Kitchen Garden.

Veltheimia (velthēim-ia, after Herr Veltheim. Ord. Liliaceae).—Greenhouse bulbs, only one species of which, viridifolia (syn. Aletris capensis—*Botanical Magazine*, t. 501), is much grown; it has thick, shining green leaves and does well in a room window. Sandy loam suits. Propagation is by offsets.

Venidium (venīd-ium. Ord. Compositae).—A small genus, the best-known member of which is calendulaceum (syn. fugax), a hardy annual with yellow and black flowers in summer, height about 18 ins. For culture, *see* Annuals.

Ventilation.—*See* Greenhouse.

Venus's Fly-trap, Dionaea muscipula.

Venus's Looking-glass, Specularia Speculum.

Venus's Navelwort, Omphalodes verna.

Veratrum, False Hellebore (verā-trum, from *vere*, truly, and *ater*, black, in allusion to the colour of the roots. Ord. Liliaceae).—Hardy herbaceous perennials. Album, white flowers in summer, 3 to 5 ft.; nigrum (*Botanical Magazine*, t. 963), dark purple; and viride, green, summer, 3 to 4 ft. (syn. album viride), are the most grown. The White Hellebore powder used for killing caterpillars is prepared from album. Good loamy soil or friable clay is liked. Propagation is by seed or division in spring.

Verbascum, Mullein (verbās-cum, from *barbascum*, bearded, in allusion to the stamens. Ord. Scrophularineae).—Hardy biennials and herbaceous perennials or sub-shrubs, mostly with yellow flowers in summer. Chaixii, 3 ft.; cupreum, coppery, 3 ft. (*Botanical Magazine*, t. 1226); olympicum, 5 ft., a biennial; and phoeniceum (*Bot. Mag.*, t. 885), violet, 3 ft., several varieties, are the best species. Ordinary soil. Propagation by seeds, and in the case of the perennials also by division in spring.

Verbena, Vervain (verbē-na, from the Celtic *Ferfain*. Ord. Verbenaceae).—Beautiful and fragrant flowers, once specialised by florists and grown in pots under varietal names, but now generally restricted to the flower garden, and grown from mixed seed. Only two of the many species are grown to any extent, and they are: (1) Aubletia, mauve, a hardy biennial growing about a foot high, and flowering in summer; compacta and rosea are varieties (*see* the *Botanical Magazine*, t. 308); (2) venosa (*Bot. Mag.*, t. 3127), rosy-lilac, 1 ft., summer, a half-hardy herbaceous perennial, much used in beds and borders on account of its free blooming and distinct colour. The hybrid Verbenas are best treated as tender annuals, being raised from seed in heat in winter, pricked off in boxes, hardened, and planted out 18 ins. apart in early summer; they will

thrive in any fertile soil. There are several named varieties which are good for the flower garden and come true from seed; among these are Adonis, crimson; Ellen Willmott, pink; Princess of Wales, violet; Queen of Whites, and Scarlet King.

Verbena, Lemon-scented.—*See* Lippia citriodora.

Veronica, Speedwell (verōn-ica. Ord. Scrophularineae).—A very large genus of herbs and shrubs, mostly hardy, and able to thrive on poor soil. Among the best of the hardy herbaceous species are gentianoides, blue, 2 ft., early summer (*Botanical Magazine*, t. 1002), there are white and variegated-leaved varieties; incana, violet, forms a silvery carpet in early summer; longifolia subsessilis, blue, summer, 3 ft.; repens, creeper, blue; spicata, blue, 1 ft., summer, there is a white variety; Teucrium, blue, summer, forms a carpet, dubia is a variety of it; and Virginica, white, summer, 3 to 4 ft. These may all be propagated by seed or spring division. The following are a few of the best of the shrubs and sub-shrubs: Andersoni, purple, late summer, 3 ft., not quite hardy, variegata is a form of it; Bidwillii, blue and white, summer, prostrate; cupressoides, violet, summer, 1 to 3 ft., much grown in the rock garden for its foliage and habit; epacridea, white, summer, half hardy, the leaves have a buff tint in autumn; Hectori, lilac, summer, 1 to 2 ft., the foliage has a pretty buff tint in autumn; pinguifolia, white, summer, 2 ft., glaucous foliage (syn. carnosula—*Bot. Mag.*, tt. 6147 and 6587); saxatilis, the Rock Speedwell, blue, summer, 6 ins., alba and rosea are varieties of it; speciosa, purplish-blue, spring, 2 to 3 ft., half hardy, evergreen (*Bot. Mag.*, t. 4075); and Traversii, white, summer, 3 to 6 ft. (*Bot. Mag.*, t. 6390). Chamaedrys is the Germander Speedwell. Syriaca, blue, early summer, 6 ins., is a hardy annual; it has a white variety, alba. The propagation of the herbaceous species is by division or seed in spring; of the shrubs by cuttings in a sandy mixture of peat and loam under a hand-light in spring or summer; and of the annuals by seed in spring. The Veronicas like limestone soil.

Vervain.—*See* Verbena.

Vetch.—*See* Vicia.

Vetch, Bitter.—*See* Orobus.

Vetch, Chickling, Lathyrus sativus.

Vetch, Crown.—*See* Coronilla.

Vetch, Milk.—*See* Astragalus.

Viburnum, Guelder Rose (vibūr-num, from *veio*, to tie, referring to a use of the shoots. Ord. Caprifoliaceae).—A large genus of shrubs and small trees, some hardy and evergreen, others deciduous. Opulus is the common Guelder Rose or Snowball Tree, and sterile a superior garden form in which all the flowers are sterile; there is a variegated-leaved form of Opulus, and also a dwarf, nanum; these are hardy deciduous shrubs. Tinus (*Botanical Magazine*, t. 38) is the Laurustinus, a hardy evergreen, with white and rose flowers in autumn and winter; it makes a useful shrub from 4 to 8 ft. high, and is compact in habit; there are several forms, including a variegated. Plicatum, strictly tomentosum plicatum, is a splendid

deciduous shrub 4 to 6 ft. high, with sterile flowers in spring. The foregoing are the best of the Viburnums, but Lantana, the Wayfaring Tree of the hedges, is an interesting species, with white flowers in spring and dark berries in autumn. Lantanoides is the American Wayfaring Tree. The Viburnums are not particular as to soil. Plicatum enjoys peat and loam. The Laurustinus will thrive almost anywhere; it forces well in winter, as does the Guelder Rose; they may be potted-up in autumn. Propagation is by cuttings under a hand-light in autumn in a shady border, or by layers.

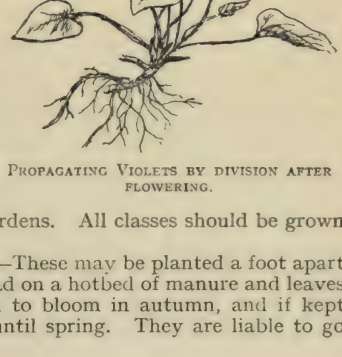
Vicia, Vetch, Tare (vīc-ia, from *vincio*, to bind, in allusion to the tendrils. Ord. Leguminosae).—A useful genus, one member of which, Faba, the Broad Bean, is much in demand (*see* Kitchen Garden). Cracca is the Cow Vetch, lathyroides the Spring Vetch. Ordinary soil. Propagation is by seed.

Victoria Regia (victōr-ia, after the late Queen Victoria. Ord. Nymphaeaceae).—A noble hothouse aquatic, with enormous rimmed leaves, which in some cases are capable of supporting a fairly heavy man, and white or rosy-white flowers a foot across (*see* the *Botanical Magazine*, tt. 4275, 4278). It came from the river Amazon. It is only suitable for large places. Propagation is by seed put into a pot of loamy soil and kept in warm water. Trickeri is a newer species, smaller both in leaf and bloom, but otherwise resembling regia; it will thrive in a cooler house.

Vinca, Periwinkle (vīn-ca, from *vinculum*, a band, in allusion to the long, tough shoots. Ord. Apocynaceae).—Useful evergreens, the hardy members of which, major, purple, summer, 2 ft.; and minor, blue, summer, 1 ft., are good for planting under trees and in other shady places. There is a useful variegated form of major. They are not particular as to soil. Propagation is by division or cuttings in a shady place in spring.

Vine. — *See* Fruit — Grapes, also Vitis.

Viola, Violet, Pansy (vī-ola, the original Latin name. Ord. Violaceae).—We have few more delightful flowers than the little Viola, for it gives us the sweet Violet of the hedgerows, the large varieties which we force in frames for winter bloom, the "tufted Pansies" which we use for beds and borders, and many charming species for our rock gardens. All classes should be grown in gardens.



PROPAGATING VIOLETS BY DIVISION AFTER FLOWERING.

Sweet Violets (Viola odorata).—These may be planted a foot apart in a foot of good loamy soil spread on a hotbed of manure and leaves in September. They will begin to bloom in autumn, and if kept healthy will flower on and off until spring. They are liable to go

wrong through an attack of red spider, but that rarely happens if they are kept supplied with water as required, and air when the weather is fine. If they show signs of weakness they may be stimulated with weekly doses of liquid manure. In spring they may be lifted and divided, if they are varieties of tufted habit, the portions being planted in rich soil in a cool place, where they will soon establish themselves and grow into forcing plants by September. They will not thrive in hot, dry, poor soil in a sun-scorched spot. Some sorts throw out runners, and these may be pegged to the soil and transplanted when rooted. Colonies of Violets should be established in shady, cool parts of the garden and left to flower naturally. The following are splendid varieties of the Sweet Violet:—

Comte de Brazza, double white
Kaiser Wilhelm, single purple
La France, single violet
Marie Louise, double lavender
Princess of Wales, large single blue

The *tufted Pansies* are good for carpeting beds of standard Roses, or for mixing with bedding plants; also for forming margins. If put out in April, and picked over weekly, they will bloom all the summer. They may be propagated in autumn by cuttings, like the larger Pansies. For other notes and select varieties, *see* Pansy. Viola tricolor is the Pansy or Heart's-ease (*see* Pansy). A few species of Viola are charming for the rockery, notably biflora, yellow, early summer, 3 ins. (*Botanical Magazine*, t. 2089); calcarata, blue, spring, 6 ins.; cornuta, blue, late spring, 6 ins. (*Bot. Mag.*, t. 791); cucullata, violet, spring, 6 ins. (*Bot. Mag.*, t. 1795); gracilis, purple, 6 ins., spring; and pedata, blue, spring, 6 ins. (*Bot. Mag.*, t. 89). There are white varieties of several. They will thrive in most soils, if not hot and dry, but a fertile, friable loam is best. Propagation is by seed under glass in winter in a warm house, pricking off and hardening preparatory to planting out; by division in spring, and by cuttings in a frame in early autumn.

Violet, African, Saintpaulia ionantha.

Violet, Bog, Pinguicula.

Violet, Dame's, Hesperis matronalis.

Violet, Dog's, Viola canina.

Violet, Dog's Tooth, Erythronium Dens Canis.

Violet, Water, Hottonia palustris.

Viper's Bugloss, Echium.

Viper's Grass, Scorzonera hispanica.

Virginian Cowslip, Mertensia virginica.

Virginian Creeper.—This is the Ampelopsis hederacea or Vitis inconstans of the botanists; the latter is the modern name of Veitch's Virginian Creeper, which was formerly known as Ampelopsis Veitchii. It is a much better plant than A. hederacea—less coarse, less rampant; it clings closely by means of small, sucker-like shoots that exude a kind of resin and give it a tight hold on masonry. The foliage is smaller than that of hederacea, and turns bright red in autumn before falling. The Virginian Creepers will thrive in most soils, but in shallow, dry soils they are a good while getting estab-

lished unless provided with a capacious pocket of loam and manure. They grow and colour best on a south aspect. Plants may be put in from pots up to May.

Virgin's Bower.—*See* Clematis.

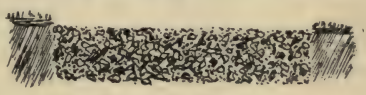
Viscaria, Rock Lychnis (viscā-ria, from *viscus*, birdlime, in allusion to the sticky stems. Ord. Caryophylleae).—The Viscarias are now linked with the Lychnises by botanists, but seedsmen offer cardinalis, caerulea, and oculata, which grow about a foot high. For culture, *see* Annuals—Hardy.

Viscum, Mistletoe (vīs-cum, from *viscus*, birdlime, owing to the glutinous matter in the berries. Ord. Loranthaceae).—*See* Mistletoe.

Vitis, Vine (vī-tis, from the Celtic *swyd* or *vid*. Ord. Ampelideae).—A genus of climbing shrubs. Vinifera is the Grape Vine (*see* Fruit). Inconstans (syns. Veitchii, tricuspidata, and japonica of gardens) is the small-leaved Virginian Creeper (which see). Coignetiae is a fine species, with large leaves that assume a rich colour in autumn. Labrusca is sweet, and has purplish fruits. Henryana, green leaves with white lines, 5-lobed, is red in autumn. They are good for trellises and pergolas. They will thrive in any fertile, well-drained loamy soil. Propagation is by cuttings.

Vriesia.—*See* Tillandsia.

Wahlenbergia (wahlenbēr-gia, after Dr. Wahlenberg. Ord. Campanulaceae).—A large but unimportant genus, only a few species being grown. These include Kitaibelii, blue, summer, 6 ins., a hardy herbaceous perennial; saxicola (*Botanical Magazine*, t. 6613), lilac, early summer, 6 ins., half hardy; and tenuifolia, violet, summer, 6 ins., a hardy perennial. Ordinary soil. Propagation by seeds and division in spring.



A BADLY MADE WALK.
The material is alike throughout; the path is flat, and there is no drainage.

Waldsteinia (waldstēī-nia, after Herr von Waldstein. Ord. Rosaceae).—A small genus, only two species being grown much; these are fragarioides (*Botanical Magazine*, t. 1567), yellow, early summer, 1 ft. (syn. Dalibarda fragarioides); and trifolia, yellow, spring, 6 ins., a nice rock plant. Ordinary soil. Propagation is by seed or division in spring.



HOW TO DRAIN A WALK.
1. Main drain. 2. Small drain. 3. Rubble. 4. Gravel.

Walks.—Good walks are a great advantage in the garden. They are best made by preparing a 9-in.-deep bed, laying on well-rammed stone, chalk,

or flint bound with clinkers, and surfaced with 2 ins. of gravel. If on a slope it is well to coat the sides with hot tar to take the water, and set trapped take-away drains at every 10 ft. to carry the water down to 3-in. tile drains laid in the bed. The edges should be on the same level, and pegs should be driven in to get the proper level to the centre, which may be 3 ins. higher in a 6-ft. path, and half an inch more or less for every foot wider or narrower. The width must, of course, vary with the traffic. If the walk has to carry heavy vehicles more care should be taken with the foundation. The gravel should be rolled after rain, and should be watered once or twice a year with weed-killer. Leaves should be regularly swept up in autumn. Grass paths should be provided wherever possible, especially among flower beds and the principal herbaceous borders. *See* Flower Garden.

Wall Cress, Arabis.

Wallflower (Cheiranthus Cheiri. Ord. Cruciferae).—An invaluable hardy plant, best treated as a biennial, flowering profusely in spring from seed sown out of doors the previous June, rich in colour, and deliciously scented. It will thrive in most soils, and never does better than on limestone, which it loves; it will grow on banks and walls. It is not quite happy, however, in town gardens. The seed should be sown thinly in late spring, the plants thinned, and put out 9 ins. apart during showery weather in summer; they can then be left without anxiety until the autumn, when places can be found for them in beds and borders. A patch should be planted near the house, so that the perfume can be fully enjoyed; the soil should be dug, but not manured, or the plants will get too gross. They should be lifted with balls of soil about the roots. The single Wallflowers are hardier than the doubles. Blood-red, yellow, old gold, brown, purple, apricot, and ruby can be bought in separate colours. The Annual Wallflower blooms the same year if sown in early spring. Old Castle, yellow, is good for walls.

Wall Pennywort, Cotyledon Umbilicus.

Wall Pepper, Sedum acre.

Wall Rue, Asplenium Ruta-muraria.

Walls.—It has been pointed out (*see* Fences) that a wall is the best enclosing line for a garden, but likewise the most expensive. The advantages of a wall will outweigh the drawback of extra cost where it is desired to have a support for glass houses or trees, and to form sheltered borders. In large places it is common to find the place protected with an outside fence, and an inner wall built to make an enclosure for glass, fruit, and vegetables. If the wall has to support large houses it must be at least 10 ft. high and well buttressed, but it is not necessary to maintain the full height all round. A 6-ft. wall is very useful. Borders from 10 to 20 ft. wide should be made along the wall, and those on the south and west aspects will be useful for early crops. A brick wall with a coping looks well. Finials over the gate pillars give a neat appearance. Builders are always ready to give estimates for erecting walls. Flat-trained trees may be planted to cover the faces. Wall gardening now engages the attention of many flower lovers; in some cases such

plants as Sedums, Pinks, Sempervivums, Wallflowers, Corydalises, Arabises, Aubrietias, Alyssum saxatile, Cerastiums, Valerian, and encrusted Saxifrages are established merely by sprinkling a few seeds into chinks; in others spikes are driven into the wall to support small flattish stones, on which plants are established. A steep bank may be made beautiful by making a rough wall of unmortared stones against its face, and here all the plants named above, with Campanulas, Hutchinsia Alpina, and many other pretty things, will thrive. Walls are also adorned with fruit and with climbing plants. *See* Fruit and Climbers.

Walnut.—*See* Juglans.

Wardian Case.—This is useful for sending plants from abroad, for it can be kept close, so that delicate plants are not injured by frequent changes of temperature. We occasionally see it in a room window, but less frequently than of yore. It was a favourite device of our forefathers to block the approach to a window with a large plant case and live in an atmosphere of mustiness. Given abundance of space a Wardian case planted with ferns has good claims to a place in a shady window. Provision should be made for drawing off surplus water.



A Trap for Wasps.
One handlight is fitted over another, with a hole in the lower one. A saucer of sour beer or syrup draws the wasps in.

Wasps.—When present in large numbers these are a great trial to gardeners; they enter fruit houses and do a good deal of damage. It is a mistake to put bottles of syrup in or near the houses with the object of drawing the wasps away from the fruit, as the sugary preparation attracts wasps to the garden. Queen wasps should be killed when they appear in the spring. Pieces of fine canvas may be put over the ventilators. Nests may be sought for, marked, and attacked at night with boiling tar, or a lighted squib of gunpowder and sulphur may be pushed in and the hole stopped with damp earth after the explosion in order to prevent the fumes from escaping.

Water Aloe, Stratiotes aloides.

Water Archer, Sagittaria sagittifolia.

Water Avens, Geum rivale.

Water Bean, Nelumbium.

Water Cress.—*See* Kitchen Garden and Nasturtium.

Water Flag, Iris Pseudacorus.

Water Gladiole, Butomus umbellatus.

Watering.—The watering of plants has a great bearing on their health, particularly if they are in pots, and should be studied by cultivators. It may be assumed that every plant needs water when it is growing, but it must not be assumed that it needs the same amount every day. A plant gets rid of more moisture by leaf-evaporation on a hot, dry day than on a cool, wet one, consequently water is more likely to be needed under the former than under the latter conditions. Signs of want of water are: flaccid growth, soil

cracking from the side of the pot, hollow ringing of the pot when rapped with the knuckles. The last is a good test, and should be used in order to anticipate the two others, which may lead to disaster. If flagging and soil-cracking accompany each other it is useless to attempt to put matters right by ordinary watering, as the water will all run through. The pot should be stood in a pail of water for a few minutes, when the soil will swell again. Watering will be necessary almost every day in summer, for one plant or other, but not in winter, except in heated houses where the plants are in active growth. As little watering as possible should be done in winter, especially in cool houses, and no water should be spilled about. In summer, on the contrary, syringing is a valuable auxiliary to watering. Room plants should not be kept in saucers of water, except perhaps in very hot weather. It does foliage plants good to sponge the leaves with soft tepid water once a week. Soft water is always preferable to hard. Tea is of no benefit to plants; but half an ounce each of nitrate of soda and superphosphate per gallon turns water into a valuable liquid manure. A good plan of watering seedlings is to moisten the soil from below by holding the pot or pan up to the brim in a vessel of water. It is a good plan to use water of the temperature of the house in watering hothouse plants.

Watering-pots or cans.—A selection of these is useful in every garden. A small one with a long spout is handy for use in greenhouses with wide stages. The pots should be used carefully, in order to avoid sending a flood of water among young plants that have not a very tight hold of the soil. A larger can is useful for feeding water into the small one where there is no cask or tank handy to dip from. The watering-pots should be supplied with roses in case it is desired to spread the water in a shower; and it is advisable to have both a coarse and a fine rose, the latter for use with seedlings. Water-cans should be turned upside down when not in use. *See also* Watering.

Water Lily.—*See* Nymphaea and Flower Garden.

Water Plants.—*See* Flower Garden—Aquatics.

Water Reed.—*See* Arundo.

Water Soldier, Stratiotes aloides.

Water Violet, Hottonia palustris.

Watsonia (watsō-nia, after W. Watson. Ord. Irideae).—*See* Bulbs.

Wattle.—*See* Acacia.

Wax Flower.—*See* Hoya.

Wayfaring Tree.—*See* Viburnum Lantana.

Weeds.—The fight with weeds may begin when the ground is dug in winter; perennial weeds such as Couch, Dandelion, Bindweed, Daisy, Plantain, Shepherd's Purse, Thistle, Coltsfoot, and Horsetail may then be picked out, thrown into a heap and burned. As fast as annual weeds show in spring they should be hoed up into the

sun; this should be continued through the summer. The last crop of annual weeds, which has no time to seed, may be dug in as green manure. *See also* Walks.

Weeping Ash, Fraxinus Excelsior pendula.

Weeping Willow, Salix Babylonica.

Weigela.—*See* Diervilla and Flower Garden—Shrubs.

Wellingtonia.—*See* Sequoia.

Welsh Poppy, Meconopsis cambrica.

Westeria.—*See* Wistaria.

West Wind, Flower of the.—*See* Zephyranthes.

Weymouth Pine, Pinus strobus.

Whin.—*See* Ulex.

White Hellebore.—*See* Veratrum.

White Thorn, Crataegus oxyacantha.

Whitlavia (whitlā-via, after Mr. Whitley. Ord. Solanaceae).—Botanists now class this genus with Phacelia. Seedsmen offer grandiflora (*see* the *Botanical Magazine*, t. 4813); it has violet flowers in summer. For culture, *see* Annuals—Hardy. Height 1 ft.

Whitlow Grass (Draba).—*See* Flower Garden—Rockery.

Whortleberry, Vaccinium Myrtillus.

Wigandia (wigān-dia, after Bishop Wigand. Ord. Hydrophyllaceae). — Handsome herbaceous perennials, used in bedding and sub-tropical gardening for their fine foliage. Caracassana (syn. macrophylla) is the best. It is illustrated in the *Botanical Register*, t. 1966. They like well-manured loamy soil. Propagation is by seeds in heat in March.

Wild Hyacinth, Scilla festalis.

Willow.—*See* Salix.

Willow, Kilmarnock, Salix caprea pendula.

Willow, Weeping.—*See* Salix.

Willow Herb.—*See* Epilobium.

Wind Flower.—*See* Anemone and Bulbs.

Window Gardening.—This is the only phase of plant culture possible to many people, either because they suffer from bad health or because they have no garden. But window gardening is worth practising for its own sake, inasmuch as it not only forms a delightful pastime, but makes the home attractive. It might be dealt with in two sections: window and outdoor work. Indoor window gardening is often conducted with very bad judgment, especially where there are prize competitions, for the whole of the window space is packed with a pyramidal erection of plants, which prevents access to the window for the purpose of providing ventilation, and darkens the room, thus rendering it unhealthy. There should never be a mass of plants packed in a window. Nor should the window area be blocked with large wire frames. A few well-grown plants on a ledge suffice. These should be arranged so that the window can be opened easily, in order that there may be no excuse for neglecting ventilation. Of flowering plants suitable for window culture in

their season may be mentioned Hyacinths, Tulips, Daffodils, Freesias, Primula sinensis, Pelargoniums, Zonal and Ivy Geraniums, Francoa (Bridal Wreath), Solanums, Campanula isophylla, Begonias, Cytisus, Heliotrope, Musk, Myrtles, Epiphyllums, and Phyllocactus. The most hardy and accommodating foliage plant is the Aspidistra, but palms and ferns may be grown (see those subjects). Watering presents a difficulty, owing to the necessity for preventing surplus water from splashing about. Perhaps the best plan is to grow the plants in ordinary pots stood within ornamental bowls, which will catch the water that passes through the pots. They should be emptied frequently, especially in winter. An alternative plan is to use earthenware saucers. Outside window gardening generally finds expression in window-boxes, which may be made to fit the sill, and should be provided with drainage holes to permit superfluous moisture to escape. These boxes look very well painted dark green, but there is scope for the exercise of handiwork in the form of ornamental tiles, virgin cork, or other embellishments. Those who like to have their boxes furnished the whole year may procure a few small Conifers, Tree Ivies, or Euonymuses for the winter, and put bulbs among them for spring bloom. The Conifers could be grown in tubs through the summer. Failing them, Wallflowers and Primroses, which are green in winter, could be used. For the summer, Zonal and Ivy-leaved Geraniums, Marguerites, Fuchsias, Begonias, Heliotrope, Petunias, Mimuluses, Pansies, and Tropacolums are available. All of these could be planted in June.

For shady windows a Wardian case (which see) with ferns is good; or foliage plants may be chosen, such as palms (*see* Palms), Aralia Sieboldii, India-rubber plants, Aspidistra, and Araucaria excelsa. The best plant for a window-basket is perhaps Campanula isophylla.

Wineberry, Vaccinium Myrtillus.

Wineberry, Japanese, Rubus phoenicolasius.

Winter Aconite (Eranthis hyemalis).—*See* Bulbs.

Winter Cherry, Physalis Alkekengi and Solanum Capsicastrum.

Winter Daffodil, Sternbergia lutea.

Winter Green.—*See* Pyrola.

Winter Moth.—*See* Fruit—Apple enemies.

Winter Sweet, Origanum.

Wireworm.—The grub of a click beetle, Agriotes or Elater. It is about an inch long, yellowish, and very hard. It attacks many plants, and is very destructive in the garden. In mild attacks choice plants can be guarded with baits of Potato, Carrot, or Mangold impaled on sticks, but if the pest is abundant it is well to fallow the ground for at least 3 months, spread on a coat of gas lime at the rate of ½ lb. per square yard, let it lie 6 weeks, and then dig it in. Vaporite or Apterite may be dug in during spring. Thorough cultivation does good, both by strengthening the plants and worrying the grubs.

Wistaria (wistā-ria, after C. Wistar. Ord. Leguminosae).—A hardy deciduous climber which produces large pendulous racemes

of mauve flowers in early summer. Chinensis (syns. sinensis and Glycine sinensis—*Botanical Magazine*, t. 2083) is much the most popular species; alba is a white, flore pleno a double, and variegata a variegated-leaved form of it. Multijuga (syn. grandiflora) is a handsome species with long lilac racemes. They like a well-drained loamy soil. Propagation is by layering the young shoots. Old plants may be spurred to the ripe wood like Grape Vines.

Witch Elm, Ulmus glabra and montana.

Witch Hazel, Hamamelis.

Witches' Brooms (Witch Knots).—These are bundles of twig-like growths, seen on Birches, Beeches, Silver Firs, and other trees, and due to fungi. They should be cut out and burned.

Witloef or **Witloof.**—*See* Kitchen Garden and Chicory.

Woad, Dyer's, Isatis tinctoria.

Wolf Berry, Symphoricarpus occidentalis.

Wolf's-bane, Aconitum.

Wood Ashes.—Containing potash and phosphoric acid, the ash from garden fires is excellent in the garden, particularly for Peas and Potatoes. It is good for spreading in the drills when sowing Carrots and for dusting over young Turnips to keep down the fly. If spread over heaps of manure or mixed with urine it fixes ammonia.

Woodbine.—*See* Honeysuckle and Lonicera.

Wood Laurel, Daphne Laureola.

Wood Lily, Trillium grandiflorum.

Woodruff, Asperula.

Wood Sorrel, Oxalis Acetosella.

Wood Violet, Viola sylvatica.

Woodwardia (woodwārd-ia, after T. J. Woodward. Ord. Filices).—Vigorous ferns, best grown in a cool house, but safe out of doors in mild districts. The most popular species is radicans, which does well in baskets, where its long, arching fronds show to advantage. Brownii (syn. cristata) is a crested variety of it. Japonica is a good species, with broad fronds. Areolata (syn. angustifolia) is also fine. Equal parts of peat and loam, with sand, suit. Propagation is by spores (*see* Ferns) and division.

Woody Nightshade, Solanum Dulcamara.

Woolly Aphis.—*See* American Blight under Fruit.

Worms.—Darwin has taught us that worms are beneficial to gardeners through the vast system of soil-aeration which they conduct. No one, therefore, should object to their presence in the garden. They are out of place in flower-pots, and do harm by clogging the drainage. Compost should be passed through the fingers in potting so that small worms may be picked out. When pot plants are stood in frames or in the garden, a thick layer of cinders should intervene between the bottom of the pots and the

ground. If worms get into pots, stir a little mustard in some water and pour it in. Worms are also a nuisance in lawns when in sufficient quantities to cover the grass with their "casts." Lime-water may be used to bring them up. *See* Lime.

Wych Elm, Ulmus glabra and montana.

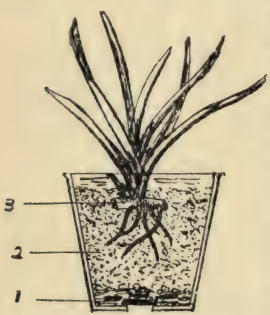
Xeranthemum (xerān-themum, from *xeros*, dry, and *anthos*, a flower—everlastings. Ord. Compositae).—Now classed with Helichrysum by botanists. Seedsmen offer annuum, purple, summer, 2 ft., and various colours. Sow outdoors in spring.

Xiphion.—*See* Iris.

Yarrow.—*See* Achillea.

Yew.—*See* Taxus.

Yucca, Adam's Needle (yūc-ca, the Peruvian name. Ord. Liliaceae).—Handsome foliage plants, several of the best of which, such as angustifolia, filamentosa, and gloriosa, are hardy. Angustifolia (*Botanical Magazine*, t. 2236) has narrow leaves and bears white flowers in July; stricta is a variety of it. Filamentosa (*Botanical Register*, t. 900), the Silk Grass, has threads on the margins of the leaves, and bears white flowers in June; flaccida and variegata are varieties. Gloriosa (*Bot. Mag.*, t. 1260) is longer, with stiff, erect, glaucous leaves, and white or pale red flowers in summer; there are several varieties of it. Recurvifolia, with long recurving leaves and white flowers in summer, is also good. The most popular of the greenhouse species is aloifolia (*Bot. Mag.*, t. 1700), which has leaves about 18 ins. long, with a reddish spine at the tip; it has white flowers in spring; there are many varieties, among which variegata is a favourite. In addition there are many handsome hybrids, such as elegantissima, Guiglielmi, Imperator, magnifica, and praecox. As a rule the Yuccas do not flower while young, but filamentosa is an exception. They like loamy soil, lightened with mortar rubbish and enriched with decayed manure. Propagation is by suckers, or cuttings of the roots inserted in a frame. Whether in pots or outdoors they dislike stiff, wet soil. Little water is needed in winter.



Propagating Yuccas by Root Cuttings.
1. Drainage. 2. Soil.
3. Root cutting.
Strike in gentle bottom heat.

Zauschneria californica, Californian Fuchsia (zauschnē-ria, after Herr Zauschner. Ord. Onagrarieae).—A half-hardy Californian shrub, growing about a foot high, with scarlet flowers in summer; grandiflora and latifolia (*Botanical Magazine*, t. 4493) are varieties. It may be grown in light loamy soil on a sunny rockery or in pots in a frame. Propagation is by seeds or cuttings.

Zea, Maize, Indian Corn (zē-a, from *zeo*, to live. Ord. Gramineae). —*See* Maize.

Zebrina.—*See* Tradescantia.

Zenobia speciosa (zenō-bia, after a Queen of Palmyra. Ord. Ericaceae).—A hardy shrub, with white drooping flowers in summer, height 3 to 4 ft. It likes sandy peat. Propagation is by seed in spring or layers. Andromeda cassinaefolia is a synonym. *See* the *Botanical Magazine*, t. 970.

Zephyranthes, Zephyr Flower (zephyrān-thes, from *zephyr*, the west wind, and *anthos*, a flower. Ord. Amaryllideae).—A small genus of bulbs, the most popular of which are Atamasco, pale pink, spring, 15 ins. high, half hardy (syn. Amaryllis Atamasco—*Botanical Magazine*, t. 239); and candida, white, late summer, hardy (syn. Amaryllis candida), the Peruvian Swamp Lily (*Bot. Mag.*, t. 2607). Andersoni, yellow, spring, 6 to 9 ins., is pretty; it needs greenhouse culture. Loam with sand and a third of leaf soil suit. Propagation is by offsets, or seed if procurable.

Zinnia (zīn-nia, after Herr Zinn. Ord. Compositae).—The annual elegans, single and double, in various colours, is a most brilliant plant, growing from 1 to 2 ft. high. Seedsmen offer separate colours as well as mixtures. The doubles are the most effective, and they are good both for greenhouse and flower garden. They may be raised from seed in a warm house or frame in spring, pricked off, and either potted singly as required, or hardened in a cold frame and planted in June. Nice plants may be flowered in 5-in. pots.

Zygopetalum (zygopēt-alum, from *zygos*, a yoke, and *petalon*, a petal, in allusion to the union of the sepals. Ord. Orchidaceae).—A large genus of Orchids, flowering in autumn and winter. The beautiful species Mackaii or Mackayi has greenish flowers lined with yellow and striped with violet; it has a strong honey scent. It likes fibrous peat and chopped Sphagnum with a little loam. It succeeds in pots in an intermediate house, and enjoys shade. *See* the *Botanical Magazine*, t. 2748. Other good species are Balli, various colours; candidum, white and violet; Dayanum, white, green, and crimson; intermedium, various colours; Lindeniae, pink and white; Wallisii, white and violet; and xanthinum, yellow, red spots. There are also several beautiful hybrids, and likewise bigeneric hybrids between Batemannia and Zygopetalum and Colax and Zygopetalum.

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